

February 1937

TECHNOLOGY REVIEW

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THE TABULAR VIEW

MAIL RETURNS

HOW many women read *The Review*; how many are interested in science news and the impact of technology on modern life? We have often wondered and in divers ways sought an answer. Here, unsought, is one woman's answer, fresh from York, Pa.:

TO THE EDITOR: Please accept the thanks of an electrical engineer's wife for the not-too-technical articles you publish in *The Review*. You see, my college training was in classics; consequently, my scientific knowledge is very general, mostly vague. Now that I am surrounded by things scientific, your articles are a great help. If, for example, the conversation goes astronomical, at least I have read about the expedition to Ak Bulak [*The Review*, November, 1936] and can sit and listen with a slight glimmer of intelligence in my eyes. You know how a woman hates to be completely in the dark . . .

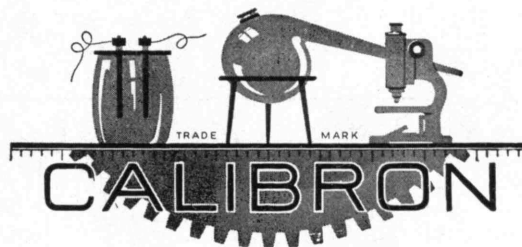
I am so glad that you printed the article, "Technics and the Woman" [*The Review*, January, 1937]. The author expresses my own feelings, as I never could, and I believe the women of my acquaintance would second those opinions. There is rarely an issue in which there is no article that I can enjoy; *The Trend of Affairs* and *The Institute Gazette* I always read. Continue to make *The Review* interesting to us laywomen and when the subscription fee comes up in the family budget, both budgeteers will assent with loud and hearty ayes.

HELEN MCCAA (MRS. J. R.)

May the ayes have it!

CONTRIBUTORS

IN the great development of America's petroleum industry ROBERT E. WILSON, '16, has played an important part. Trained as a chemical engineer, one-time associate professor of chemical engineering at the Institute, he became, in 1931, director and vice-president in charge of research and development of the Standard Oil Company of Indiana. At the present time he is vice-chairman and director of the Pan American Petroleum and Transport Company and a director of five associated companies. As the author of more than 50 scientific papers and as the holder of many patents on chemical and engineering processes, he is amply qualified to discuss our patent system and the forces that tend to impede or accelerate scientific advances. His article on page 147 was presented originally as an address at the 100th anniversary of the United States Patent Office. S. PAUL JOHNSTON, '21, is editor of *Aviation*. A recent European trip afforded him many opportunities to observe aeronautical developments abroad and his text and pictures on pages 150 and 151 are the result of this tour. FREDERICK G. FASSETT, JR., is assistant professor of English at the Institute and a frequent contributor to *The Review*. His collaborator, PAUL C. EATON, '27, is a colleague of Professor Fassett's in the Department of English. F. S. LINCOLN, '22, who contributed the cover of this issue of *The Review*, is recognized as one of America's outstanding architectural photographers. His sunset picture is one of a series of remarkably successful attempts to capture some of the "incredible splendor" of Mont St. Michel.



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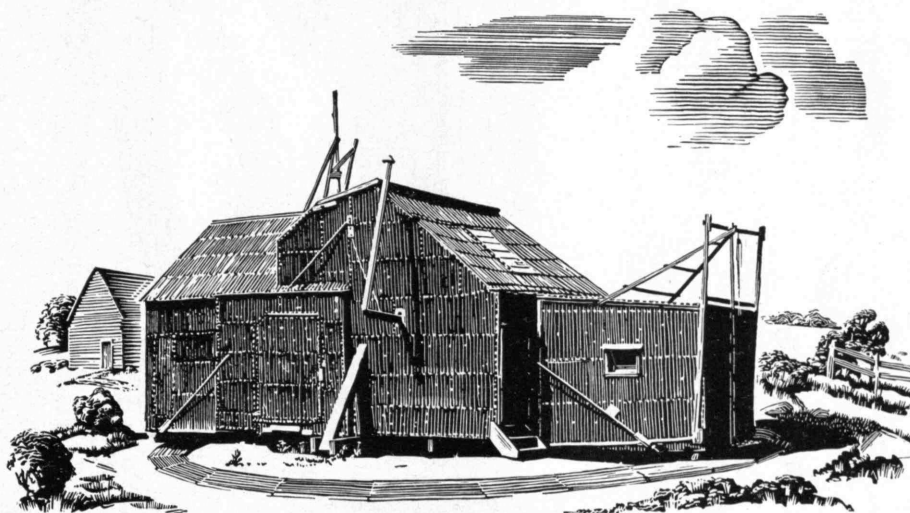
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THOMAS A. EDISON

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Dubbed by the Edison staff "Black Maria," located in the Edison Laboratory grounds at West Orange, N. J., this unpretentious structure of wood frame, covered with black roofing paper, and set on a pivot so that it could be swung around with the sun, was the first motion picture studio. From this humble birth grew the lavish splendor of the world's most romantic billion-dollar industry!

THE invention of the motion picture camera by Thomas A. Edison made possible the practical adaptation of the flexible tapelike film and laid the foundation for today's glamorous billion-dollar industry. Manufacture of motion picture films now consumes approximately 95% of all silver used in the chemical industry—nearly one-third of all silver produced in the United States.

When Thomas A. Edison opened the first central station for the distribution of electric power, he also laid the foundation for vast world markets for copper, lead, zinc, coal and many other commodities. Today the copper industry looks to the electrical industry for its largest consumer and lead used for cable covering and Storage Batteries now accounts for more than 40% of domestic consumption.

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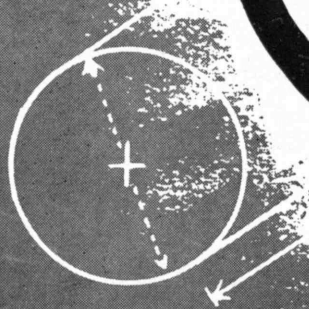




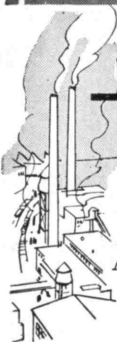
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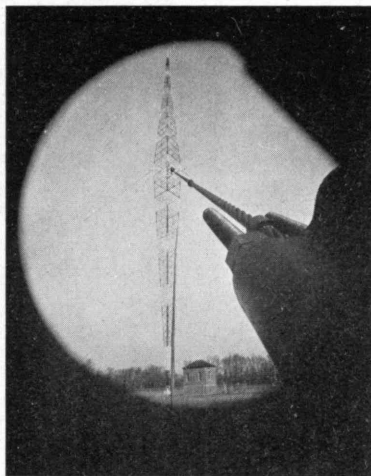
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*Cable-length view of
Columbia Broadcast-
ing System's 625-
foot vertical radiator,
Wayne, N. J.*

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VOL. 39, NO. 4

CONTENTS

FEBRUARY, 1937

THE COVER

TOUR GABRIEL, MONT ST. MICHEL, FRANCE
SILHOUETTED AGAINST THE SAND AND THE SEA OF THE NORMAN COAST
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SOARING STEEL	FRONTISPIECE	138
ENGINEERING APPLIED TO SELLING		146
THE FUTURE OF INVENTION.	BY ROBERT E. WILSON	147
<i>Incentives to Discovery Must be Maintained!</i>		
EUROPEAN TRENDS IN AIRPLANE DESIGN	BY S. PAUL JOHNSTON	150
<i>As Disclosed at the 15th Exposition Internationale de L'Aeronautique</i>		
CHARLES HAYDEN, '90		152
<i>Friend of Youth, Benefactor of Technology</i>		
SCIENCE AND AMERICAN LITERATURE	BY P. C. EATON AND F. G. FASSETT, JR.	153
<i>A New Bench Mark for Critics</i>		
OUR OWN ETCHING SHOW		160
<hr/>		
THE TABULAR VIEW		133
<i>Notes on Contributors and Contributions</i>		
THE TREND OF AFFAIRS		139
<i>News of Science and Engineering</i>		
THE INSTITUTE GAZETTE		155
<i>Relating to the Massachusetts Institute of Technology</i>		

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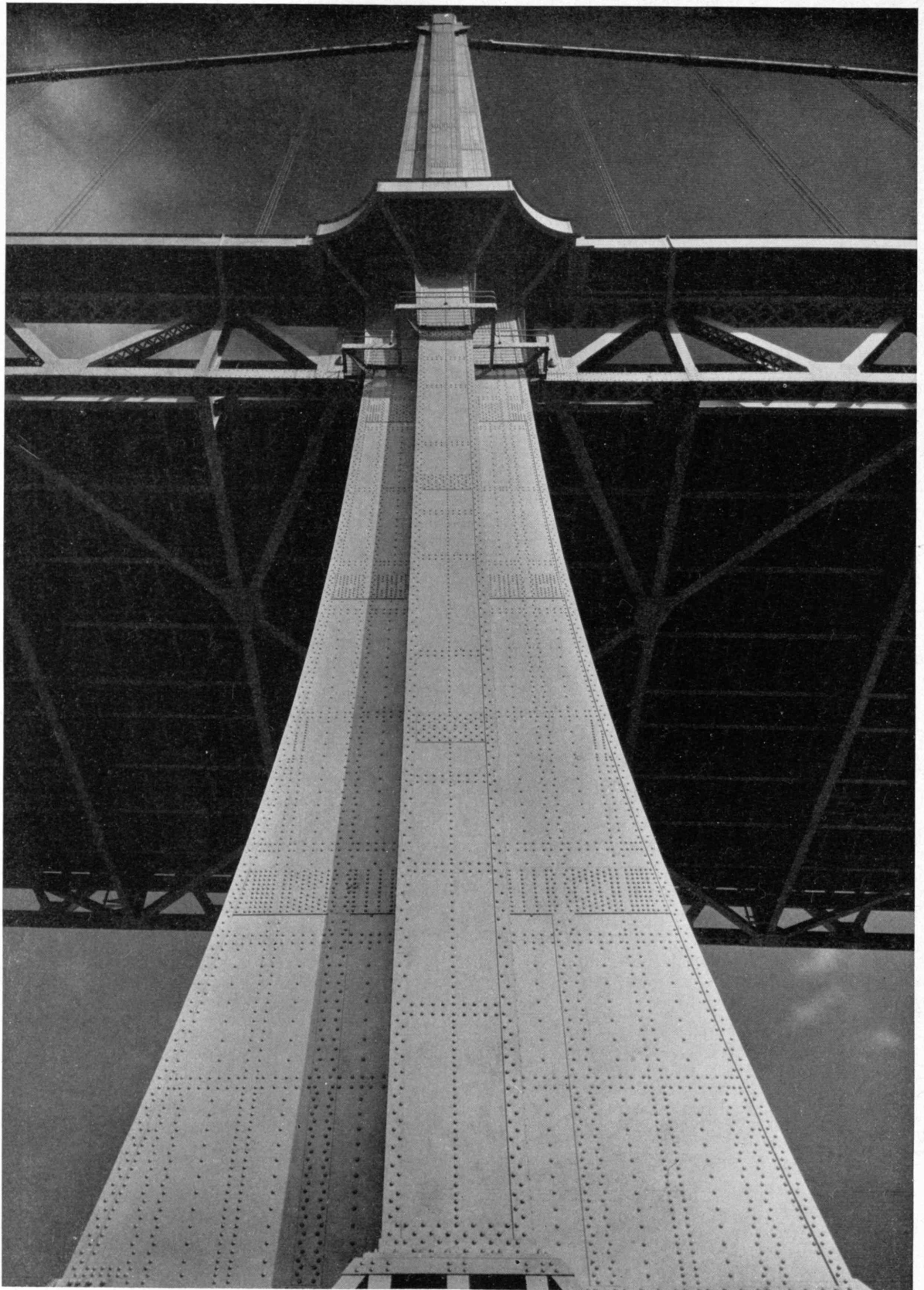
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From a Photograph of New York's Triborough Bridge by Schnall (Black Star)

SOARING STEEL

THE TECHNOLOGY REVIEW

Vol. 39, No. 4



February, 1937

The Trend of Affairs

No Resistance At All

NOW that physicists have more or less conquered the problem of atomic structure, they have divided their forces and are pushing the further attack in opposing directions. One group is advancing in the direction of still finer detail and is prying open the nucleus to see what makes it work. The other group is proceeding to large-scale phenomena, studying the social behavior of atoms when they are combined to make molecules, or liquids, or solids. Armed with the growing knowledge about the habits of atoms, these investigators are turning back to a study of everyday things — bricks and steel and rubber and oil — a study more searching and much more effective than was possible in the pre-quantum days. Already the results indicate the immense practical value of the research.

At present the study has just begun and only the simplest of atomic communities, the crystals, have been investigated in detail. The crystal, because of its regularity, is in many ways simpler in structure than a single complex molecule or than a liquid. In particular the metal crystal, composed of only one kind of atom, has been studied in some detail. There already exists a fairly voluminous literature on the relation of the structure to the properties and idiosyncrasies of metals: their strength, their specific heats, their optical properties, and so on. Some start has been made toward explaining why the electrons in some metals are foot-loose wanderers and in others are family men, resisting being pressed into service to carry electric current. It is beginning to be clear why so few metals are strongly magnetic. A start has even been made on the alloys.

In connection with these studies, a number of predictions have been made as to the behavior of metals at temperatures near the absolute zero, -273.1 degrees C.

At these low temperatures the atoms cease their random vibrations and the crystal becomes as nearly perfect as it can be. The specific heat falls to exceedingly low values, less than a thousandth of its value at ordinary temperatures. Since the atomic jostlings are diminished, the wandering electrons are less impeded and the electrical resistance is reduced. Most of these predictions have been verified by the measurements made at very low temperatures during the last few years.

In one important respect, however, the measurements made at low temperatures did not accord with theoretical predictions. It had been predicted that the electrical resistance would diminish smoothly as the temperature decreased, to become zero at absolute zero. The measurements showed another behavior, more interesting and more puzzling: As the temperature was reduced, the resistance fell; first smoothly, as the predictions would have it; then, at some critical temperature, it suddenly vanished completely. This state of no resistance is called the superconducting state. Current, once induced in a loop of superconductive wire, persists indefinitely without any diminishing of intensity. If a magnetic field is produced inside a hollow piece of ordinary metal and the temperature lowered below the transition point, the field inside the superconducting metal is "frozen in"; a change in the field outside hardly affects it.

These bewildering phenomena had not been expected and are not yet fully understood. Recently Professor J. C. Slater, Head of the Physics Department at Technology, has suggested a plausible explanation. Ordinarily the electrons which carry the current are individualists, wandering through the metal and colliding with the metal atoms, but paying little attention to each other. This state of affairs explains the ordinary resistance of metals. Professor Slater has shown that it is possible for the electrons to be in another state, a coöperative

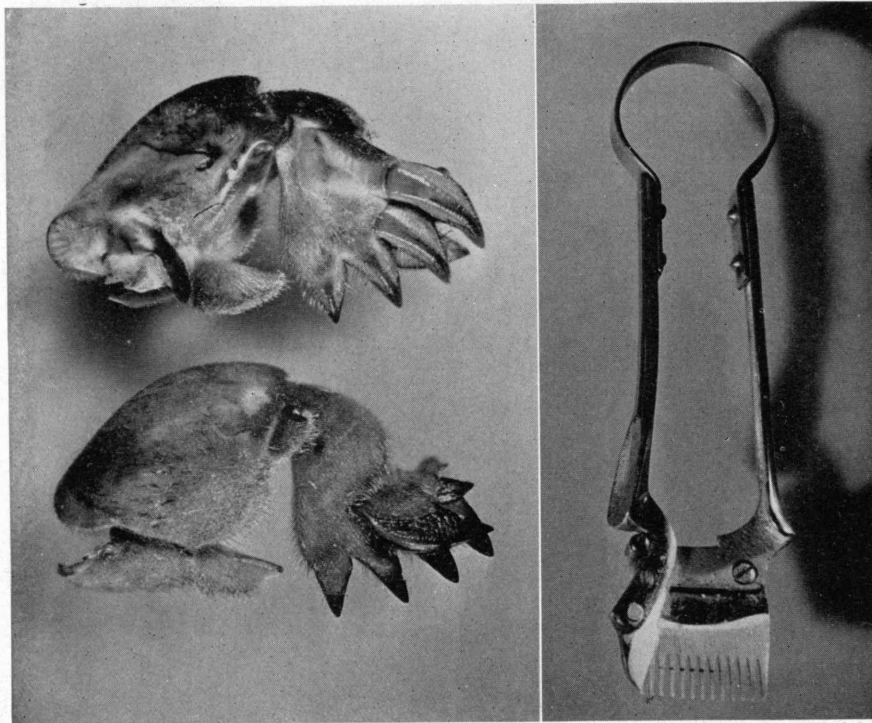
one somewhat analogous to the magnetic state in iron. In this state the electrons help each other along, and thereby may manage to avoid the collisions with metal atoms which cause the resistance. This state is possible only at low temperatures, for it requires the coöperation of all the electrons, and any large temperature motion of the atoms would jostle one or more electrons loose, thereby destroying the coöperation completely. This explanation seems to be the correct one, although its consequences need further investigation before a final decision can be made.

It is research such as this that will demonstrate the value of a thorough knowledge of atomic structure as an aid in unraveling the practical problems of matter in bulk and will ultimately confound the critics of atom splitting. It is evident now that a knowledge of such abstruse things as electron spin and the exclusion principle is necessary for the complete understanding of such practical problems as the ferromagnetism of Heusler's alloys and the toughness of steel.

Remarkable Alloy

ONE of the most interesting of the new alloys is beryllium-copper, made from one of the oldest metals and one of the newest ones. Beryllium occurs in the mineral beryl, of which mineral emerald and aquamarine are well-known varieties. It is a light metal—density, 1.84—lighter than aluminum, which has a density of 2.70. It is much harder than aluminum and will, in fact, scratch steel. It needs a high temperature to melt it (1,350 degrees C.), whereas aluminum melts readily at 659 degrees. (Iron melts at 1,533 degrees; gold, at 1,063 degrees.) Commercial beryllium-copper contains 2.0% to 2.25% of beryllium. It is ductile and malleable and can be cold worked or hot worked. After all of the forming operations are completed, articles made from beryllium-copper can be hardened and strengthened by merely heating them for a certain period of time at a comparatively low temperature.

It has been known for many years that copper alloys are hardened by a cold-working process, such as hammering, rolling, drawing, and that such work-hardened alloys can be made soft again by annealing. Beryllium-copper possesses this property; the annealing temperatures which result in softening are limited to a comparatively narrow range in the neighborhood of the melting point. An alloy of 2.15% beryllium, 0.35% nickel, the rest of the metal copper, in the form of a sheet 0.040 inch thick, when softened by annealing at 800 degrees and then quenching in water, had a tensile strength of 60,000 to 80,000 pounds per square inch. The same material, re-



Dr. Croy from Black Star

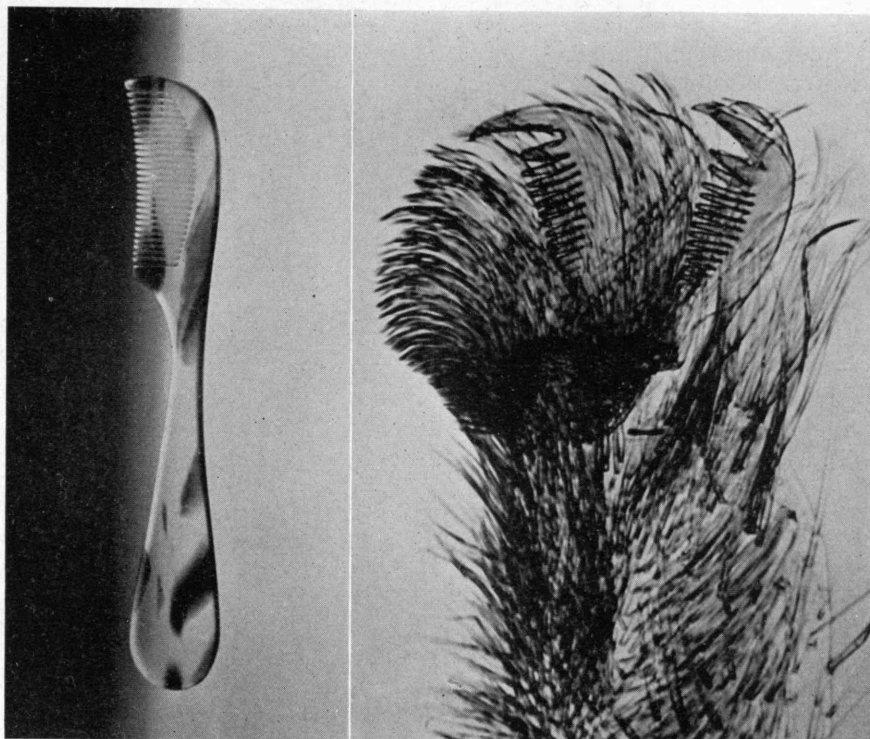
duced by rolling to half the thickness, had a tensile strength of 118,000 to 130,000 pounds per square inch. Heat treatment alone raised the tensile strength of the soft metal to 170,000 pounds, and cold working and heat treatment together raised it still higher. By suitable methods beryllium-copper articles may be produced which are harder than the hardest bronze. The alloy's resistance to wear is about five times as great as that of the best phosphor bronze and its resistance to fatigue is exceeded only by that of certain of the alloy steels. It may be soldered and welded, and behaves in corrosion tests in about the same way that pure copper does.

Although beryllium-copper is only about four years old, it is finding use in coiled springs, flat springs, diaphragms, switch blades, and so on, where its high resilience and resistance to corrosion and fatigue are desirable; in nonsparking hand tools, hammers, chisels, wrenches, and drift pins, where its hardness and shock resistance are needed; and in bearings, gears, sliding contacts, the handles of surgical instruments, woven wire cloth, and valve parts, where high resistance to wear is advantageous.

Neat

BY tying it down with steel cables, French engineers have strengthened a weakened dam on the Cheurfas River in Algeria. With the dam thus stitched to its steel foundations, the engineers were able to increase the storage level of the reservoir ten feet above its original full height. Cables have been similarly used in basting to its foundation La Jument lighthouse on the West Coast of France.

Other recent engineering activities, neatly handled: When the Cisco Sports Club, coöperating with the United States Forest Service, set out to stock with



Dr. Croy from Black Star

TOOLS IMITATING NATURE

Striking similarities between natural and man-designed devices are shown on this and the opposite page.

Clippers. *The mole cricket, like the mole, lives beneath the ground, uses its two front feet to dig and to clip fine roots. Notice the four sharp toes over which a fifth moves in a cutting motion exactly as in the metal clippers shown in parallel.*

Comb. *The foot of the cross spider shows two fine combs which are used to straighten and order its newly spun web, and to enable the spider to cling to the web*

trout the Loch Leven Lakes in the California Sierras, the fingerling trout they placed in the lakes were quickly devoured by predatory fish, such as chubs. With permission of the California Fish and Game Commission, the Club dynamited one lake experimentally, thus killed between fifteen and twenty thousand undesirable fish, and made the lake safe, at least temporarily, for fingerling trout.

❑ The Army Air Corps, fully aware of the danger of too great a dependency upon a product procurable only by import, has built an observation balloon of DuPrene, the synthetic rubber, hoping that the material might prove to be an adequate substitute for rubber. Their substitute, they found, is more than adequate: It is stronger, permits less gas leakage, and is possibly more durable than the natural rubber fabrics. With this evidence in hand, Air Corps engineers sought other air uses for DuPrene, and immediately found a most important one: hose pipe. Now they have an all-purpose synthetic rubber-coated hose which is impervious to the deteriorating qualities of coolants, gasoline, oil, and other chemical solvents.

❑ A new "quota-control" system governs the elevators in the International Building of Rockefeller Center. Calls for a car to make a trip are registered as they come in until a predetermined number or quota of calls selected for that car has been received. Subsequent calls, regardless of the floor sequence, are registered on the next car until its quota is filled. A car stops only at those floors for which calls for it are registered. Another feature of this new elevator installation is the immediate response by light which a potential passenger gets when he pushes the button, thus indicating to him at once, not only that his call is registered but at which door his car will stop.

❑ Through the use of carrier-current telephone equipment built by General Electric, TVA operators at the

Norris, Wheeler, and Wilson Dams will be able to talk with each other at will over the 230-mile, 154,000-volt transmission line connecting the three dams. The lines will not only carry high-voltage current for power but at the same time will serve as paths for small high-frequency currents carrying voice signals. A similar system on a small scale has been announced by another firm for use in residences, whereby telephone calls can be made from room to room over the electric light wiring.

By-products from Grapefruit

WHY the grapefruit, like the banana, should have acquired comical connotations is obscure. Its history, if short, is a saga of modern ballyhoo, expansion, and research, in the order named; aside from certain occasions when it has been used as a weapon against crooners and related nuisances, it leads a quiet existence full of good deeds. Even O. O. McIntyre has admitted in his column that, after overcoming an aversion of long standing, he now can't get enough of it — a somewhat surprising statement since the grapefruit industry is now so typically successful that it has a surplus problem.

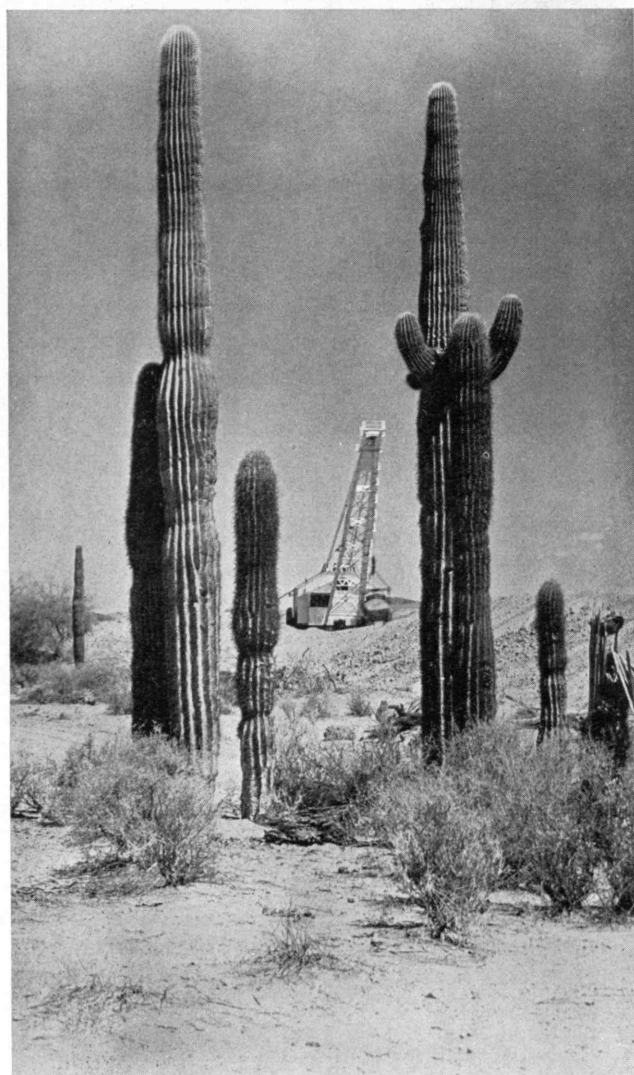
It was not always thus. In previtamin days, when winter in the North meant a long, unbroken spell of heavy foods without fresh fruits or vegetables and spring sickness was as inevitable as the thaws, exotic fruits were as little known as available. If the consumption of grapefruit among our God-fearing ancestors is an indication, it deserved, more than the apple, its name of the "forbidden fruit."

At the Chicago World's Fair in 1893, however, an attractive display of this handsome fruit enticed a few adventurous epicures to experiment with it on the breakfast table, and by 1890 some 30,000 boxes were being produced in the United States annually. For a long time

this country remained the only important market, although Canada and the British Isles now take large quantities. Imports into the United Kingdom increased sixfold from 1920 to 1924, but only after surviving a sickly infancy. Greengrocers found that customers bought only once, and who could blame them, since the fruits were so "bloomin' sour" and their peel so bitter.* Expert knowledge about the technique of consuming the fruit was rare, the general method being to attack it, with characteristic British pluck, like an orange. One enterprising English lady published a little pamphlet in 1905, entitled, "The Forbidden Fruit, or Shaddock, or Grapefruit; How to Serve and Eat It."

Today, however, in spite of tremendous sales, growers are often left with large quantities of fruit which is

* The bitterness of peel and membrane is caused by a glucoside called naringin, which is believed to have some therapeutic power (because of its bad taste?) and is more bitter than quinine; one part in 50,000 parts of water can be detected.



Bureau of Reclamation

DRAGLINE

Framed by giant cactus, this dragline is shown at work on the main canal of the Gila Federal reclamation project in Southwestern Arizona. The Gila project taps the Colorado River where its flow is regulated near Yuma below Boulder Dam, and the main canal will irrigate 150,000 acres

of unsuitable shape or color, frozen, or just without a market, while canneries (15% of the crop is so utilized) have left two pounds of waste for every pound of fruit that reaches the consumer. Through the activities of the Citrus Products Laboratories of the Department of Agriculture, by-product uses are being found for these materials. The canning industry is so concentrated in Florida that half of the peel is available for processing, and from it has been manufactured, since 1933, an amber-colored oil which smells like orange or lemon oils and equals them as a flavoring agent. Most of it goes to England to be used in beverages.

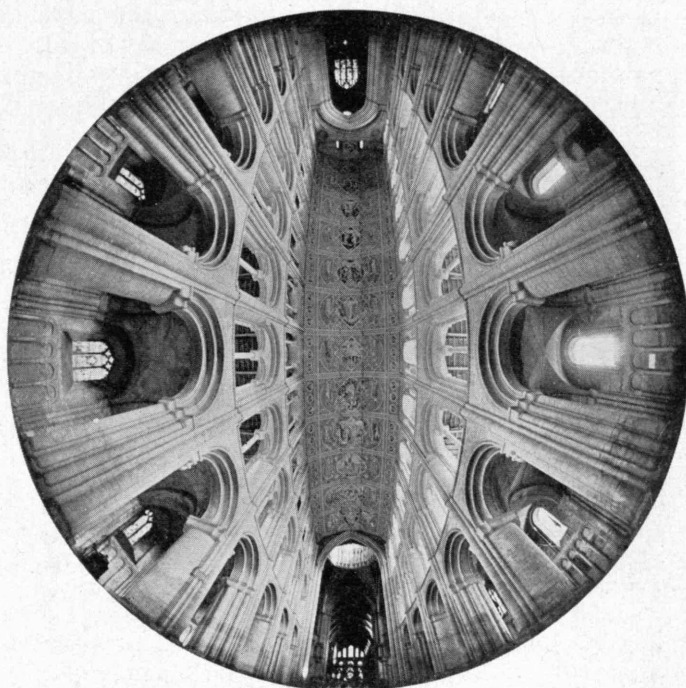
A more recent and interesting development is quite in keeping with the name: The grapefruit is called grapefruit because it frequently grows in large clusters, like grapes, and like grapes it is now being used as a source of wines, brandies, and cordials. Grapefruit champagne has already seen action at a public function at Washington where President Roosevelt indulged. Oranges are similarly utilized, and wines from these two fruits cannot be distinguished, although they both possess a flavor distinct from that of grape wines. In either case, sugar must be added, a legal and necessary process, for these citrus fruits do not contain enough natural sugars to ferment properly. In the grapefruit, total sugars run from five to eight per cent; the orange has up to 12.6%; while grapes contain from 12% to 25% sugar. High acid content in the citrus fruits is also a drawback, dry wines being excessively sour. The juice from which the wine is made is obtained from sound fruit, which is of unmarketable size or color or has been frozen, by cutting them in half and reaming on revolving burrs. Care must be taken to exclude the naringin which gives a bitter product. It has been found that baking the wine for two months at a temperature of about 125 degrees F. imparts to it a sherrylike flavor. Citrus spirits and cordials are made from the wines by the usual methods.

Although the process has been commercialized for only a few months, the five citrus wineries in Florida already have a capacity of about 20,000 gallons a year. When it is remembered that France, with half our population, has 7,000,000 people employed in her wine industry, this new venture appears to have a limitless future. However, Frenchmen haven't the American's indifference to wine.

On the Architectural Front

EARLY in this winter of 1937 one hears the steam shovels, harbingers of another building spring, snorting like bulldogs on every unoccupied corner. That the building flood is mustering its waters is clear enough from both statistical and visual evidence; that it will reach spate in the coming season seems likely. It is fun to speculate on what sort of *débris* this latest flood will leave in its wake — to guess what we may expect our architects to do with the power to beautify that is so shortly to be placed in their hands. Will their work be eclectic — will it be modern?

In guiding to a decision there are a few facts and also some rather weighty straws. Primary fact is perhaps the Oregon State Capitol Competition. Here is a community to house the capitol which, unlike Washington,



Black Star

FISH-EYE VIEWS

Ely Cathedral, Cambridgeshire (left), and Trafalgar Square, London (right), photographed with the Robin Hill Fish-eye lens. Mr. Hill's horizon camera, developed for meteorological use, makes it possible to photograph the entire sky from zenith to horizon with a single exposure

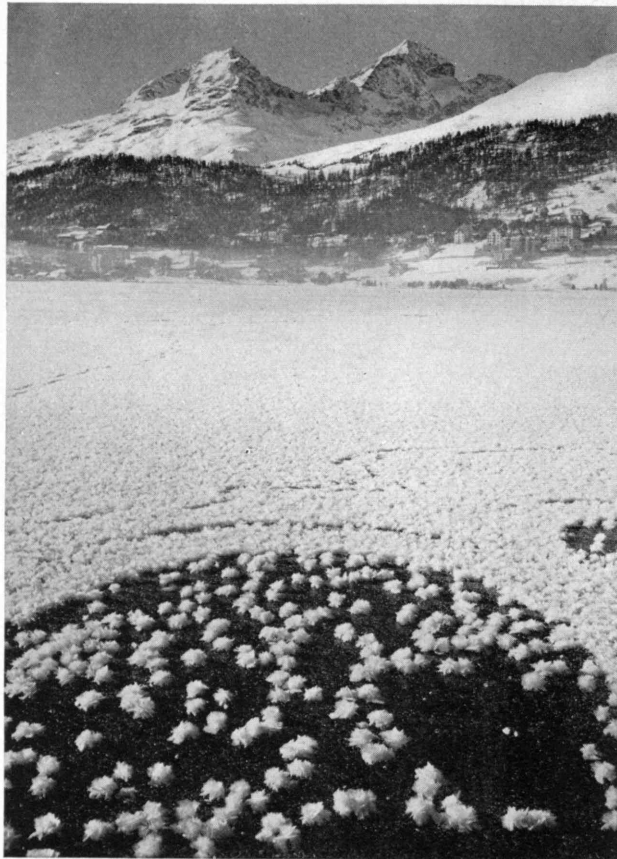
imposes no environmental limitations on the designer of a new major building. Under such circumstances a Bertram Grosvenor Goodhue was able to develop, for Nebraska, a capitol which was in the true sense of the word modern, and which, without stretching fact to exaggeration, was also timeless. Were the results of the Oregon competition as happy?

To the competition were summoned many famous names. That they were mostly of the older generation, mostly academicians, does not matter, for they might have served with their eclectic approach merely as a better foil for the scintillation of the few modern-minded men who also were invited to compete. These moderns with unanimity recognized the bicameral nature of legislative function and adopted this, together with the separation of executive and legislative powers, as the themes of their designs. They were snowed under in the voting. If their hypothesis were to be thrown out the window, it is quite probable that the design chosen as the winner was well chosen. Despite its monitor top, which replaces the conventional dome, despite the fact that the building says neither that it is Oregonian nor a capitol, the Trowbridge and Livingston opus was first class as compared with the efforts of some other rather well-known designers.

This Oregon competition ran into a good deal of difficulty of one sort and another which it is profitless to rehearse here. The significant facts are, first, that so many distinguished eclecticists could produce such a series of ill-studied designs, resembling nothing different from a series of student renderings on the same subject and, second, that any such building as is going to be built will become Oregon's capitol in the late Thirties of the Twentieth Century.

A casual item that also shows the wind is the fact that after some years of quiet the architects are again bursting forth on the gastronomic front. Just when the architect became the traditional oenophilic and gastronomic overlord of America is hard to say — probably it all began with Henry Handel Richardson. But the tradition persists. Today actual architectural articles in serious architectural publications are beginning once more to dwell with equal love on *moules au vin blanc* and the friezes of the Parthenon. This comment is no idle remark for *entr'acte* entertainment. Its implications as to the state of architecture as practised by the *boulevardier* are important — they are more important as indicating the sort of wishful thinking about a dead past that still dominates a considerable and active part of the profession.

Finally there is great food for thought in the answers to the many questionnaires recently sponsored by architectural journals. These questionnaires have principally been directed toward architectural education or toward improvement of the profession. They have been circulated among as catholic a group of reasonably well-known architects as the journals could unearth. The response to such questionnaires reveals schism. A Saarinen may point out that "the competency of the profession will increase as it learns to think clearly, and that, I am afraid, will not come until we can start afresh, educating a new generation," but most of those who will control the buildings of the next decade do not agree. Two moderns may speak in what their eclectic fellows will regard as crass language: "The profession can increase the competency of its members if it can make them conscious of their true position in the social order. . . . It is our opinion that the architectural schools are still



Stetner from Black Star

ICE FLOWERS

... on St. Moritz Lake, Switzerland

overwhelmed with a class of medieval sinecurists, walking the straight and narrow path of traditional dogma and looking forward to next summer when they can go to Europe and make bad water-color sketches." Others find all cheery and bright and right with the world, affirming with omnipresent human consolation that everything is all right and getting better; while others make this or that tiny suggestion for improvement of some minor detail and all condemn group practise such as that of Tekton.

It would probably be otherwise if the younger generation could have its say, but the actual fact is that there is precious little of the younger generation in architecture. Even without the depression, the course of modern architectural practise in this country has been such as to retard the development of youth. The depression has practically eliminated the young architect from the profession. A few have found fortunate berths and will be ready to contribute for the next decade. Many have managed to keep alive and will now come thronging back to the boards they left as many as eight years ago. The most virile, most brilliant of this depression generation, however, will have been dissatisfied with such a Fabian policy and, as fact proves clearly enough, have found success elsewhere. It will be pretty hard now to draw back to strict architecture such men as Sidney B. Waugh, '27, William E. Muschenheim, '25, or Theodor C. Müller, '26, to name only three young men of Technology. Architecture always

has and always should spill over into the allied crafts of sculpture, interior decoration, and industrial design, but when the pitcher is tipped upside down, architecture cannot expect to reverse it and find much valuable liquid left in the bottom.

This means, in total, that for the next decade the brilliant potentials of the last decade in the main may not exert force on our architecture. These potentials were probably largely modern. Any tendency to modernism from this source is therefore considerably diluted.

The Review has no position to take with respect to the relative merits of modern and eclectic architecture. We are concerned here only with what is likely to happen, and, as a result of the factors discussed, it is quite possible to foresee almost no modern architecture during the building boom, perhaps less than during the depression when some not-too-sincere modernists felt it necessary to startle the world.

In houses Americans definitely do not want modernism. For that matter, few Europeans do either. A *Tugendhaus* makes one waver in favor of the modern house, but it requires greater genius to produce a good *Tugendhaus* than it does to produce a good Georgian reproduction. The reproduction is easier to sell and for most domestic functions more comfortable, to boot. The operative builder is no dolt and he is not found building modern houses in his new developments. The fact is that there are few places in the house where organic logic produces a much better result than unorganized sentiment will. The hearth is a poor place on which to try to brew logic, as followers of other professions than architecture have found and will continue to find out.

In larger buildings the case is otherwise, but the results will not be. A library, for example, is a place to store and use books. As such the first functions are to keep the books in good condition, to make them readily accessible, and to provide proper places for using them. None of these has any relation to the disposition of niches in a Pantheon or to the orderly fenestration of an Early American town hall. It should be possible to start with the needed plan and fenestration, and by some small compromise arrive at the necessary external beauty. That is what the young men of the past decade might have done; it is hard to guess that the old men of the next decade will do it.

It will be possible, however, to watch one development of this sort. If Congress accepts the Mellon gift in the spirit in which it is offered, the new Mellon gallery,



Fatrbanks

This graceful arch has been designed for a unit in Mussolini's beautification of Rome

the design of which has been intrusted to John Russell Pope, may well be a test tube. The collection is magnificent and must be housed in such a way that the pictures may be well seen. At the same time it will be in a building which must befit the predominantly Greco-Roman surroundings. Mr. Pope has shown his ability to cope with such a problem before without too much compromise. It will be possible again.

One final comment may not be amiss in ending a long prediction. At first glance the designs for the New York World's Fair competition stand in refreshing contrast to those for Oregon's capitol. This is due only in part to the fact that more young men were invited, for eclectics and moderns alike contributed a stimulating group of designs all of which had enthusiasm and interest. This might be taken as encouragement if it were not for a rather awful counterthought: Is not the reason for this ebullience the fact that the buildings are of less permanent nature? Is the architect of today really capable of brilliant flowering but held back by cerebration when buildings that he views as important and permanent are in question? It seems so. This is most unfortunate, if true. It is the "unbuttoned joy" of a Beethoven that counts in the long run, far beyond the pedantry of a Respighi with greater musical training. To the answer that one should not indulge in unbuttoned joy with his client's money the apt riposte is that the great manages to have his fling while leaving the client something worth while. However this may be, all the signs are that modernism, as it has come from Europe, seems unlikely to flower much under the burning sun of the coming boom. Let this be consolation to those to whom it thus serves.

Tides in the Atmosphere

THIRTY miles up, the atmosphere is boiling hot, and swings in tremendous tides 12 hours apart, which are completely out of step with similar swings in the lower atmosphere. These are the conclusions reached by Dr. Chaim L. Pekeris, '29, Research Associate in the Institute's Department of Geology, through a recent inquiry into atmospheric tides. Dr. Pekeris' investigation not only reconciles several previously contradictory atmospheric phenomena, but also contributes further evidence of extremely high temperatures in the upper atmosphere.

Since in our latitudes irregular changes in the weather completely obscure the small regular semidiurnal variations in the barometer, the fact that these tides exist in the atmosphere just as they do in the ocean is not generally known. In the tropics, however, the tides can be indirectly observed because of the fact that more stable weather conditions permit the barometer to register two persistent peaks, one at about ten o'clock in the morning and the other, ten at night, with equally persistent lows at four o'clock in the morning and four in the afternoon. The striking feature of these tides is that they occur regularly at the same hours, and thus appear to follow the sun and not the moon.

The sun's dominance, however, is puzzling in view of the fact that the moon, so much closer to the earth, exerts a tidal pull more than twice as great as that of the

sun. The anomaly involved here led the French mathematician and astronomer, Laplace, to decide in 1774 that the barometric variation is brought about by the sun's heating the atmosphere — a theory called in question a century later by Lord Kelvin, who pointed out that heating by the sun would lead to a diurnal rather than a semidiurnal tide. Kelvin set up a theory that the atmosphere can swing freely with a period very close to 12 solar hours, so that the tidal action of the sun is magnified by resonance. In accordance with this theory, the atmosphere is thought to act like a tuned radio receiver, picking up one station — the sun — and being insensitive to the other — the moon. The tuning of the atmosphere, however, has to be rather sharp because the lunar day is only about an hour longer than the solar day. Recently, moreover, Professor S. Chapman of London showed that the atmosphere actually does pick up, even though very weakly, the tidal action of the moon as well as some other waves of different periods. These additional barometric waves would be expected to exist, however, in an atmosphere having a fundamental free period of 12 hours.

These observations complicated the problem by contradicting other observations which indicated that the free period of the atmosphere is not 12 but 10½ hours, a length reported in 1929 by Major G. I. Taylor, a professor of the Royal Society of London and a prominent yachtsman. The pressure wave which was caused by the great Krakatao eruption of 1883 and which went around the world several times propagated itself at a speed characteristic of an atmosphere (*Concluded on page 174*)



Rittase

"Thirty miles up the atmosphere is boiling hot and swings in tremendous tides . . ."



ENGINEERING APPLIED TO SELLING

Instead of asking their agents to travel to a convention, the United Drug Company last year decided to take the convention to their agents. Moving the mountain to Mohammed was an engineering, as well as a selling problem, and United Drug turned it over to a large group of engineers, salesmen, artists, and designers. The result was the Rexall train complete with four exhibition cars (in which the adjacent pictures were taken), two lecture cars (which also served for dancing and motion pictures), air conditioning, independent lighting plant, phone service, and a *Commodore Vanderbilt*-type steam locomotive.

The train, exhibiting 8,000 products, traveled 29,000 miles, stopped within 100 miles of every Rexall agent in the country, drew visitors totaling 2,360,001. One of the exhibition cars was a complete drug store with mirrors the whole length of one side to create the illusion of a store twice as wide as the nine-foot width of the car. The exhibits, which set a new high in display technique, were designed by Architect Nelson C. Chase, '17, with the collaboration of A. W. K. Billings, Jr., '26. The general sales manager who conceived this rolling convention and guided its successful tour was trained, it is significant to note, first as an engineer, next as an artist, and finally as a salesman.

The Future of Invention

Incentives to Discovery Must Be Maintained!

BY ROBERT E. WILSON

PROBABLY the most audacious task the human mind ever undertakes is attempting to predict what the human mind will ultimately accomplish. This is particularly true of attempting to predict what will be done by inventors — those peculiar but invaluable individuals whose principal assets are a healthy dissatisfaction with things as they are and an incurable optimism as to the possibilities of improvement. However, history has shown and I think that even the pessimistic prophets of the past, were they living today, would concede that the only gross error which could be made in such a prediction would be to underestimate the infinite possibilities of the human mind in the fields of research and invention.

In considering the probable future of invention, consideration should first be given to the rapid changes which have been taking place in the field of invention during the past few decades. Any such study reveals a number of very definite trends. We used to consider the typical invention to be a mechanical contraption put together by some ingenious individual to meet some definite need. Necessity was the mother and mechanical ingenuity the father of such inventions. Today a very brief study of patents granted or of any publication dealing with inventions indicates that the typical invention of the present is a complicated electrical device or chemical reaction which has been worked out in some well-equipped laboratory. Invention has now grown up and is more often the mother than the child of necessity, as witness the hundreds of new products trying to convince the world that it needs them.

The trend of invention today is unquestionably from the empiric toward the theoretical, from the amateur or occasional inventor to the professional, from the accidental toward the deliberate and sure, and from the individual to the organized inventing group. A consequence of these trends is a prodigious increase in both the rate and efficiency of invention and a tremendous enlargement of the field in which future inventions can and will be made. It does not mean that the day of the free-lance inventor is past — indeed the tendency for the most far-reaching inventions in any industry to come from those outside still continues — but it does mean that if the free lance is reasonably to anticipate success today he must, in addition to possessing the traditional traits of the inventor, have a thorough scientific training, proper equipment, and a well-conceived plan of attack.

Other interesting changes are taking place as a result of this shift in the general character of the process of invention. The distinction between discovery and invention, which was formerly rather clear-cut, has practically disappeared; thus a chemist searching for an effective catalysis or a new product has made an in-

vention as soon as he makes the sought-for discovery. Many of the most far-reaching discoveries and inventions of today are made by men who are not trying to invent but merely endeavoring to satisfy their scientific curiosity or explain some peculiar phenomenon. In the older field of invention the development of a highly satisfactory article generally left just one less thing to invent. In the newer field every new discovery or invention is simply a stepping stone to dozens of others with no limit in sight in the expanding horizon of science.

In discussing the probable future of invention with a number of workers in different fields I have been struck by a rather sharp divergence of opinion between men of equal ability. In general it appears that the men who are engaged in applied research in the older industries where operating costs are low and investments high feel that the quality of invention is declining and that what remains is more or less a "mopping up" process. On the other hand research workers on the outer fringes of science, or in industries where the application of science is relatively new, feel certain that the most important discoveries and inventions are those yet to be made and that the sky is the limit for the future of invention. I am personally convinced that whatever may be the future of research and invention in some particular narrow field or industry, looking at the picture broadly, the business of inventing is inseparable from the tempo of scientific advance and that the only thing which could seriously retard invention is some untoward curb on the development of science. Of course the maximum intensity of invention will continue to shift from field to field as it has in the past. While I feel certain that chemical inventions are to continue for many years their amazing rate of increase, I believe that the particular fields in which the number of important inventions is likely to increase most rapidly during the next century are those of medicine and agriculture, particularly as research in these fields is taken up more and more by highly trained scientific specialists rather than by men trained along conventional medical or agricultural lines. Our agricultural traditions were largely inherited from North Europe, whose climatic conditions differ markedly from ours, and one result has been the loss of a staggering proportion of our topsoil in about a century of such farming. Only extensive and thorough research can stop such loss before it is too late. I firmly believe that in another century our descendants will look back upon the present as merely a part of the dark ages of agriculture and medicine.

Some pessimistic persons who believe that the curve of invention is flattening have pointed to the fact that, in spite of the tremendous increase in the number of scientifically trained men and the number of research workers in this country, the number of patents issued by

the United States Patent Office during the past 50 years has barely kept pace with our increase in population and not at all with the increase in the number of men who are devoting their lives to the attempt to discover new facts and invent new products and processes.

There are three principal explanations for this relatively slow increase in the number of patents: In the first place, the older fields of invention open to the entire population have been pretty well worked out and our newer generations are having little opportunity to develop either mechanical ingenuity or inventive faculties in this push-button age which insists on hiding the working parts of every mechanism. Our scientific workers have had to offset this loss before they could show a net gain. In the second place the standard of invention in our Patent Office today is certainly higher than it was, as should indeed be the case in view of the general advance in knowledge. Third, and probably most important, is the fact that while the type of invention made by the average inventor of the last century was usually related closely enough to our everyday needs to find prompt use and justify patenting, the average discovery or invention made by the scientist today is in a realm which, while ultimately of great importance, is less likely to have actual immediate application or definite cash value within the 17-year life of a patent. Accordingly the tendency is to patent a smaller proportion of the inventions which are being made in the field of science. That the actual pace of scientific discovery and invention is still increasing in geometric ratio is apparent when we note the rate of increase in the number of original scientific articles which have appeared during the same 50-year period. To illustrate: The number of chemical articles and patents abstracted by *Chemical Abstracts*, which has endeavored to cover its field completely, has been, for certain typical years selected at nine-year intervals, roughly as follows: 1908 — 10,800; 1917 — 15,600; 1926 — 29,200; 1935 — 61,800. It will be noted that the abstracts have approximately doubled in each of the last nine-year periods.

From these and many other facts, I feel certain that the process of discovery and invention is still young and vigorous with no limit in sight either as to new facts which can be uncovered by diligent research or new human wants and needs to keep up the demand for invention. However, it needs no Chinese proverb to teach us that trees do not grow to heaven, and even though there is an ever-expanding sphere into which the growth of science can conceivably continue, we cannot overlook the possibility that there may be some inherent weakness in the structure as a whole which will in time retard or even ultimately stop this growth of invention, just as unfavorable climatic conditions, or lack of nourishment from the roots, or attack by outside agents will ultimately stop the growth of a tree. Probably the most interesting aspect of the question of the future of invention to which we can address ourselves today is to attempt to appraise those factors which might tend to retard or limit the growth of science and invention, and consider what we might do to prevent such a disaster.

One such retarding factor to the future of invention is that the proportion of men working on the frontiers of science to develop new facts and principles has lagged

far behind the number working on the utilization of these principles and their application to everyday problems. For example, the number of highly trained men working in the field of pure science and doing the real pioneering work is today about the same as ten years ago, while the number of such men in our industrial research laboratories has grown by leaps and bounds. Today it seems probable that on the whole our workers in applied science are living off the fat of prior discoveries, a process which cannot continue indefinitely.

This shift in emphasis has been due first to the rapidly increasing demand from industrial laboratories for better and better trained men at salaries higher than our universities and foundation laboratories can pay. During this same decade the income of our endowed laboratories has on the average declined slightly whereas the money spent on applied research has probably nearly doubled. It will be difficult to reverse this trend because the rate of return on endowment investments seems destined to remain very low, and the prospects for great increases in private endowments, such as marked the post-War period, seem rather gloomy in view of the many expedients which have been developed to prevent the accumulation or transmission of large stores of private capital. Furthermore, in the case of the privately endowed educational institution the shrinkage in income is generally felt with particular emphasis in its research activities, as its educational activities naturally have first call on the available income.

As possible remedies for this situation, there are four which seem worthy of consideration: In the first place, the building up of privately endowed institutions from which so many of our scientific discoveries have come should be encouraged, not only by lower taxation on bequests to such institutions but preferably by lower taxation on the entire estates of men who give a substantial proportion of their inheritance to nonprofit scientific or charitable institutions. Such a change in policy would certainly be in the public interest and should have both popular and political support, once its aim is appreciated.

In the second place, our industrial research laboratories must in the future assume more of the responsibility for seeing that certain fields of pure science bearing upon their industry are investigated from a long-range point of view. A number of our outstanding industrial laboratories have already taken this broad-gauge attitude and are profiting thereby, but it is still difficult to persuade the average industrial concern to permit its research laboratories to carry out investigations for which no immediate use can be described in advance, and the organization of these laboratories is generally not flexible enough to permit men with fertile imaginations to roam beyond the range of the immediate problems which they consider it their duty to attack. The companies which do undertake this type of work will reap increasing rewards as time goes on.

The third possible avenue for restoring the balance between pure and applied research is by governmental aid. It is a rather sad commentary on a civilization which owes so much to science and which could gain so much from further applications of science, that of the billions of dollars spent to relieve unemployment during

the recent depression an almost negligible amount went to the support of any sort of scientific activity, in spite of the specific recommendations to this effect by numerous scientific groups and governmental bodies. It seems an economic crime that thousands of young and well-trained scientists had to work on all sorts of "made-work" projects which made no use of their scientific ability when they would have been overjoyed at an opportunity to utilize their knowledge and acquire experience by working on the many scientific problems which are crying for solution, even on matters closely related to governmental problems, as for example, agriculture, public health, housing, and road building.

However, the unemployment of really well-trained research workers is no longer a major problem and the present question is what the government ought to do to aid and foster fundamental scientific research. The logical answer appears to be to expand and improve the work in pure science carried on in the various government bureaus. It goes without saying that such work must be carried out strictly on the merit system without political influence either in hiring the men or directing their work. Such expenditures would relieve unemployment both directly and indirectly, but the ultimate value to our welfare should be far greater than from any other use to which the money could be put. Our state universities should also see the merit, both from an educational and scientific point of view, of increasing their support of fundamental research, since they have so much talent available for its guidance. The quality of scientific work emanating from many of our Middle Western state universities is certainly a cause for congratulation.

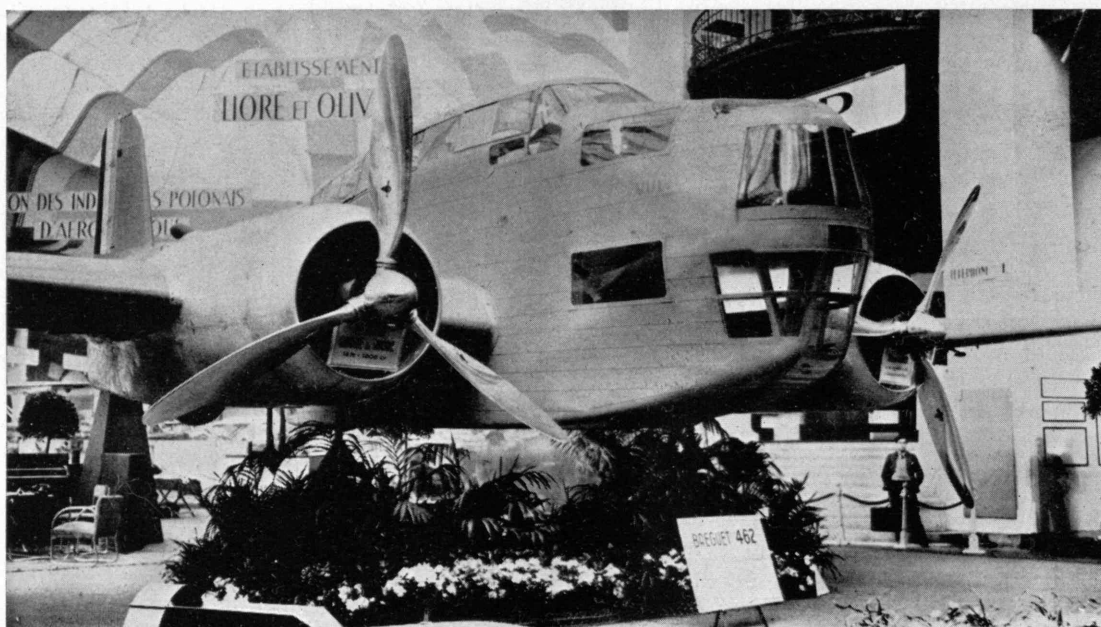
There is one other possible method of financing an increasing amount of scientific work, which should not be overlooked, and that is from the proceeds of the occasional highly profitable commercial invention which may be made in these noncommercial laboratories. In certain fields, particularly in medical research, there is an ethical tradition against the patenting of any scientific discovery bearing upon the health of human beings. However, more and more medical scientists are coming to adopt the broader view that to protect a medical invention from exploitation and insure its prompt availability, it is frequently necessary to take out patents, grant licenses, and charge reasonable royalties, and where such royalties are devoted to the support of further research, preferably in the same general field as that from which the royalties came, the research worker has certainly made a much more lasting and valuable contribution to human welfare than if he should fail to patent and leave the invention to the mercy of the quack and the exploiter. The administration of such patents may have been open to criticism in a few cases, but intelligent control by a qualified board of trustees is certainly preferable to no control, and much productive research has already been financed by this method.

A further threat to the future of invention is the increasing tendency throughout the world toward regimentation and governmental control in every field. Both the Fascist and the Communist *régimes* have made gestures in the direction of fostering research, but when they start as they do by exiling all scientists not in sympathy with the ruling party, destroying academic freedom, and seizing the control (*Continued on page 164*)

So clear is the water in this photograph that the logs appear to be suspended in air!



Rittase



THE BULBOUS NOSE

... of this French bomber suggests the physiognomy of a prize fighter. A heavyweight it is and cumbersome, but it is said to be an efficient long-range weight carrier. Known as Breguet's Vultur, it is produced, as its architecture might imply, in a passenger-carrying version

EUROPEAN TRENDS

As Disclosed at the 15th Exposition

BY S. PAUL



LIKE A DEAD TREE

... to which the buzzards flock, the Paris Salon drew mostly bombers and other military planes. In the immediate foreground above is Britain's Bristol Blenheim bomber; behind it is the newest Amiot. The huge wing in the background belongs to the Farman, Centaur II, commercial transport for "Air France"

LIKE A WASP

... with stinger between its hind legs is this latest and unconventional design of Fokker's. It is built for attack, light bombing, and reconnaissance

FLASHING electric bulbs in gun muzzles and swift bombers pregnant with fish-tailed eggs set the tone of the 1936 Paris Show and reflected the general state of mind of Europe today. Where New York's 1937 Aviation Show is boasting a ten-to-one ratio of civil over military exhibits, the military far and away outnumbered the civil at the Paris Salon.

The influence of technical progress that has marked our own commercial developments was obvious. Most of the big machines fitted into the common twin-engined monoplane formula of our Boeings and Douglasses. Except for a few French civil aircraft, all-metal ships were the rule. Flush riveting appears in the ascendancy and a considerable interest was shown in electric spot welding. Controllable-pitch propellers were the rule rather than the exception, with honors about equally divided be-





MOST RADICAL

... was Koolhoven's fighter, a single-seater with engine (Lorraine U-12) in the middle of the fuselage (behind the pilot) and with twin propellers. Landing gear is completely retractable; lateral control by wing tip slots; expected top speed: 320 miles per hour

IN AIRPLANE DESIGN

Internationale de L'Aeronautique

JOHNSTON

tween the Hamilton Standard hydraulic type, built under license abroad, and the Ratier air and electric-driven types. Curtiss-Wright, only all-American exhibitor, featured a new constant-speed electric controllable.

Propeller brakes, seldom seen in this country, appeared on a surprisingly large number of installations. Engines of the radial air-cooled type predominated, with many 14-cylinder, twin-row types in evidence. United States-developed cowling, with trailing edge flaps for controlled cooling, was almost universal. Few liquid-cooled engines were actually installed in aircraft, but both Rolls-Royce and Hispano-Suiza exhibited large power plants of this type. Outstanding was the Rolls-Royce *Merlin*, said to deliver some 1,065 horse power with 1,318 pounds all-up weight. Only one Diesel, the French *Coatalen*, put in an appearance.

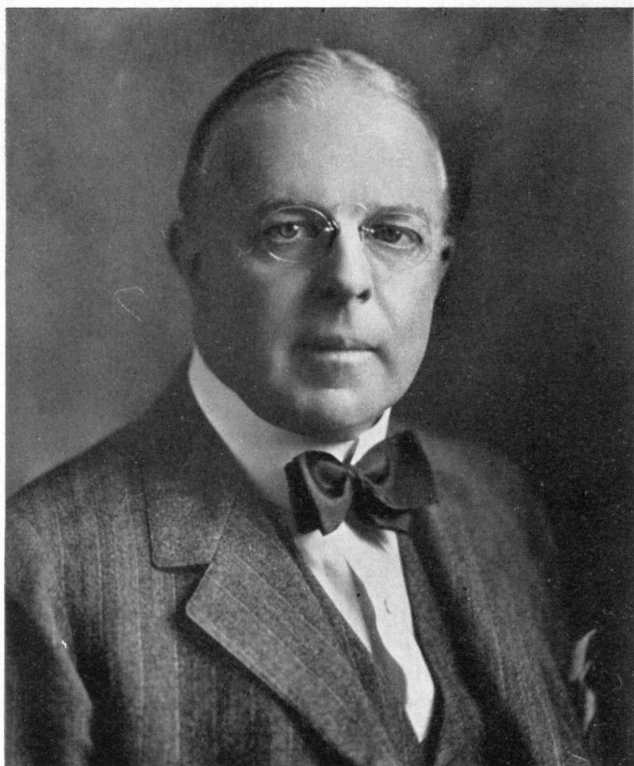


SLEEK AND SHINY

... this beautifully faired Amiot bomber has almost attained the ultimate in "clean design." Note the offset inclosure for the pilot's head, the curved mullions of the windows. There are rumors that cannons are being mounted in planes, may change the whole aspect of aerial warfare

PERT AND TINY

... is Mignet's Cabin Louse (Pou-de-Ciel it is called with entomological inexactitude). Within its narrow confines may be found all the luxury of a coupé



"I am firmly convinced," wrote he in his will, "that the future of this nation, and of the world for that matter, depends in no small part on the young men of the United States."

At the youthful age of 19," noted *Barron's*, 15 years ago, "there was graduated from the Massachusetts Institute of Technology a fair-haired . . . Boston lad who was destined to play a prominent and creditable part in the world of industry and finance. Indomitable ambition, a clear brain, and a likable personality constituted his assets." This lad whose youthfulness was so distinctive as a Bachelor of Science was the man, still distinguished for his youthfulness, who died on January 8 at the age of 67.

Charles Hayden — "always busy, he looks younger than he is" — himself always young, even as a director of directors sitting on the boards of 72 corporations, preserved after his death his accent on youth by making his largest bequest (\$1,000,000) to the Institute and by leaving the bulk of his \$50,000,000 fortune to establish a charitable foundation for the education of boys and young men and the "advancement of their moral, mental, and physical well-being."

Mr. Hayden's bequest to the Institute capped a long series of gifts that up to his death already had totaled nearly \$700,000. "His interest in the welfare of young men," wrote President Compton last month, "is memorialized at the Institute by the dormitory unit which he contributed and which, by action of the executive committee, bears his name. His interest in his professional training in mining engineering was given material

Charles Hayden, '90

(1870-1937)

Friend of Youth, Benefactor of Technology

HE BEQUEATHED ONE MILLION DOLLARS
TO THE INSTITUTE

expression in his contribution of a principal portion of the funds used in the construction of the Institute's building devoted to mining and metallurgy. In addition to these major contributions Mr. Hayden was continually and quietly contributing to student needs, as for example in various ways to aid in the development of recreational sports so much needed in an institution of this type where the academic load is severe.

"To all of his Institute colleagues and friends, Mr. Hayden exhibited his impulsively warm and generous disposition, his colorful personality, and that fundamentally sincere devotion to the welfare of young men which is so notably expressed in the terms of his will. Mr. Hayden's generous bequest serves to emphasize the constructive value of his lifelong interest in the institution and the great personal loss suffered in his passing. At the time of his death, he was not only a Life Member of the Corporation of the Institute but was also a member of its finance committee, chairman of its student loan fund committee, and chairman of the Research Associates of M.I.T. To the latter two of these activities Mr. Hayden had been a generous contributor as well as active in their administration."

Despite his extraordinary activity in banking and finance Mr. Hayden found time to participate in many other Institute activities. He was president of the Class of 1890, and his classmates have vivid memories of the enthusiastic part he played in the great Reunion of 1916 when the present buildings of the Institute were dedicated. He made his yacht available for class activities, and at the now famous telephone dinner of 1916 he played a major part in raising \$1,500,000 in response to "the mysterious Mr. Smith's" offer to give \$2,500,000 if Alumni would contribute \$1,500,000 more.

In 1925 he became president of the Alumni Association and during his term of office he called a conference between the executive committees of the Corporation and the Association, and from this meeting came the opinion "that more than an auditorium, more than a new gymnasium with swimming pool, more than anything else the two committees could imagine, the Institute needed additional dormitories." The outcome was a drive for money (Mr. Hayden contributed substantially), and an ultimate doubling of the Institute's dormitories (Concluded on page 170)



Mr. Hayden (in white) entertaining classmates on board his yacht during the 1916 Technology Reunion

Science and American Literature

A New Bench Mark for Critics

BY PAUL C. EATON AND FREDERICK G. FASSETT, JR.

"American science dashes along at 50, 60 miles an hour; but American literature still lumbers along in the old-fashioned stage-coach at ten miles an hour." — Joaquin Miller, 1902.

VENTURESOMENESS and curiosity, controlled always by a shrewd pragmatism, are conspicuous qualities of the American. It is, therefore, not surprising that they have worked themselves out as the major influences identified thus far in efforts at critical appraisal of American literature. The Puritan tradition, the frontier tradition, the class struggle, and politico-economic determinism are the four main threads with which critics have tried to bind together the three centuries of literary creation in America.

These are, in some senses, mutually exclusive, to the critics' exasperation. But it is conceivable that certain significant expressions of American life may have fallen outside the critics' field of vision. The philosophic individualism and the commercial speculation which sent the Puritans across the Atlantic, later pushed the frontiers westward, and later still were stultified into the class struggle, likewise begot a fifth force which may lessen the critics' trouble in synthesizing the others. This force is science.

Science, as it affects life and so literature, is either the quest for truth stripped of anthropomorphic considerations or, in its engineering phase, the manipulation of combinations of measurable fact for an economic motive. At the one extreme, it is profoundly philosophic, questioning the bases and justification of life itself. At the other, it permeates the existence of every man, surrounding, amusing, and often harassing him with tangible material objects; raising to the thousandth power his range of communication, and so cutting down insularity and independence at the same time; and increasing the speed of all things to such an extent that the superlatives no longer can express it.

Any measurable social factor works as an influence on literature in two ways: subjectively on the author as part of his social and intellectual *milieu*; objectively both as it affects the mass of idea, character, and setting from which he draws his material, and as it conditions the time and taste of those for whom he must write, and upon whom his existence therefore depends. Both the philosophic and the material aspects of science have affected literature in each of these ways.

The development of American national culture is peculiar among the cultures of the civilized world in that the bulk of it occurred during the period of greatest scientific advance. Even today, no other civilized man is affected so often and so variously in his daily life by science as is the American. It is the more regrettable, therefore, that the coincidence and the correlation of the

development of science and of American literature should have been hidden so thoroughly from critical attention by forces which at different times have been dominant.

From the Colonial period down through to the most modern of contemporary literature, the new terminology which science has applied to man's quest for truth has become an increasingly conscious concern of the reflective spirit. Deliberately, many a creative mind has sought to help the average man resolve the doubts which this terminology has raised in his soul. The sweep of the subjective influence of engineering upon authors may be measured by the distance from the quill pen to the dictaphone, with all that it implies. The material aspect of science, too, is at work subjectively upon the literary artist when he makes a sincere effort to assimilate to literature a body of new material which science puts before him; such efforts were made in America before Hawthorne wrote "The Celestial Railroad," and the end is not yet. Objectively, the fourth aspect of science brings about a new popular demand nearly every week; in literature, the least result of these demands has been the creation of an entire new school, that of the pulp magazine.

In its earliest manifestations in American life, science was not productive of objective and immediately measurable social results. Here, as in Europe, scientific pursuits during those earliest decades were essentially the amusement and recreation of ingenious minds. The creation of literature was likewise in the main confined to such minds. It is significant that both Cotton Mather, the Puritan divine, and William Byrd, the Virginia cavalier, were carrying on scientific investigation and speculation as an adjunct to the writing of sermons and the managing of estates. Mather's activity in the small-pox inoculation controversies of his time needs no elaboration; his reports to the Royal Society, of which he was a member, are, however, much less well known. Byrd recorded with accuracy his observations on the geology, topography, and meteorology of a hitherto unexplored region. The fact of recording is important in itself. But more important is the fact that these records, made even with little or no thought of publication, evidence the personal interest in things scientific which was held by a family aristocratic at once socially and intellectually.

The obvious early example of our thesis, of course, is Benjamin Franklin. Enough has been said to suggest that he was not at all the isolated figure he often appears, but because of both his own personal fame and the spectacular nature of some of his experiments, he was of especial importance. His work served in large measure to crystallize latent interest in science both here and in the Old World and, thus, to bring science as a core of

thinking to the forefront of creative and, consequently, literary minds wherever they were. With him, moreover, there ends the period of primarily speculative or recreational interest and begins a period of applied interest which was to have its greatest impact in the form of engineering. Franklin's lightning rods were arrows pointing toward the airplane. Franklin, too, was about at the last of the age in which science was the preoccupation of a relatively small group of scholarly minds, and about at the beginning of the new age of wider and wider popular interest.

The first century of this new age was engrossed in the mastering and exploitation of a continent. Fortunately for Americans of the present, the beginning of this period of exploration and exploitation nearly coincided with the beginning of a period of the greatest inventive activity in history, and of the application of science to material ends. Thus was enabled the performance in a century of a task which otherwise might still be incomplete; thus also was the literature of the frontier made possible and implemented with many results of science ranging from the Colt's revolver to barbed wire. Obviously, the main preoccupation of the American mind during this time was an engineering preoccupation. Nevertheless, interest in the speculative and philosophic phase of science continued, somewhat apart from and subordinate to the main stream. It is significant that the two American authors of the time whose main interest was in this temporarily secondary phase are the two whom it is hardest to integrate into American literature as a body — Poe and Hawthorne.

These men, thus insulated from the main current of engineering, seem equally to have isolated themselves from the important in the life of their time. But this appearance is false. It will not do to dismiss Hawthorne thus summarily because the period of exploitation did not stir him, because the Civil War, for instance, left him practically unruffled. It is entirely likely that this inheritor, philosophically, of Jonathan Edwards was drawn to that phase of scientific interest which will in the ultimate prove to be of the greatest importance to humankind. In him, the ethical and moral sense of the Puritan warns against the penalties which may be imposed upon interference with a closed natural system. "Rappaccini's Daughter" and "Dr. Heidigger's Experiment" are in a sense anticipations of O'Neill's "Dynamo." Poe, like Brockden Brown, failing often to distinguish science from pseudoscience, found in phrenology, mesmerism, and illuminism exploitable literary material. That the bulk of Poe's work was in the arabesque and the bulk of Hawthorne's in the romantic past may in part be explained by the fact that they were repelled by the immediate material and engineering preoccupations of their era.

When the continent had been mastered and the pioneering spirit had no longer any open spaces to contend with, it perforce turned back upon itself, and there commenced the still continuing period of industrialization and urbanization which has precipitated in America the class struggle, at once the oldest and the newest phenomenon which men of letters have endeavored to treat. It is with this latter — and in many important elements scientific — frontier that Dreiser, Sinclair,

Frank Norris, for example, have to deal. The class struggle as these men have depicted it in their novels is essentially a clash between him who has power and them who have it not. In the novels themselves, the fundamental power must often be obscured because it is presented in terms of economic control, of entrenched wealth, of corrupt union leaders, or of cynical wielders of financial monopoly. But starting with whatever term the author has used, it is a short step to the origin of the power in the machine and the idea which engendered it. That idea sprang from science.

While minds developed in this period were concerning themselves with the plight of their fellows caught between the battle lines of those who controlled and those who were controlled by the tools of production, other minds pondered in seclusion upon the meaning of it. Their efforts at a philosophic synthesis appear in works as widely divergent as those of Henry Adams and Mark Twain.

So much has been written about the impact of Darwin's hypothesis upon Arnold, Browning, Clough, and Tennyson that its effect on American thought as reflected in literature has been obscured. Nowhere in "In Memoriam" nor in "Dover Beach" is there such utter hopelessness as is to be found in the little-read "Mysterious Stranger" or in "What is Man?". Mark Twain's frontier armor and inherited Calvinism were not proof against the implications of evolution. Twain was not equipped to cope with the idea on the philosophic plane; robbed in his later years of the boisterousness and the bluster of the Mississippi and the gold camps, and hampered by the fact that he had a reputation as a humorist, he was forced into futility by the attack of science upon his traditional system of belief.

In the somewhat rarer intellectual atmosphere of the Puritan tradition and Harvard College, Henry Adams had little better fortune when, as a result of the St. Louis Exposition, he tried to assimilate science to an accepted scheme of faith. Adams' strategy was first a retreat into the Middle Ages and then a frontal attack, which was blocked not by his incapacity but by the fact that any efforts to set up a philosophic pattern comprehending both the Virgin and the Dynamo must have been nullified by the closed system of physics, the limits of physical knowledge, of his time. He should have had opportunity to write in the light of later research. The optimism which had appeared earlier in Emerson reached its frustration in Adams, much as the scientific flight from science of Thoreau was counterbalanced by the hearty but unscientific acceptance of it by Whitman.

Connecting the American literature of the present day with that of the two centuries before the World War has been, for those who have attempted to do so in terms of any one of the four accepted influences, a difficult task. There is little enough of the Puritan in John Dos Passos or in Theodore Dreiser, of the class struggle in James Branch Cabell, of the frontier in Edna St. Vincent Millay, of the politico-economic in Ernest Hemingway. But the work of these and of nearly everyone else who has written in America since the debauching of science by economics and imperialism from 1914 to 1918 is positively or negatively charged by contact with science. The cutback and flashback (*Concluded on page 169*)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

House of Tomorrow—On Alumni Day

ALUMNI Day's center of gravity last year was a conference on transportation; this year one of the bold-face items on the program will be a conference on, or better, a preview of, the house of tomorrow — its financing, its materials and architecture, and its neighborhood. Last year's transportation fest drew big-wigs as speakers, attracted many alert Alumni who found it an opportunity to inform themselves about a major factor in American life, and produced pronounced ripples of attention throughout the country as shown by requests requiring the reprinting of ten thousand copies of papers presented.

The housing preview on June 7 (the date of Alumni Day this year) bids fair to be a bigger smash hit than last year's transportation show. Shelter is of vital and intimate interest to every one; we all are anxious to hear how engineering is going to affect the hearthstone, how city planning is progressing in providing our children with a healthy, less dangerous environment, and whether large-scale housing, with or without government aid, is to show in coming years any genuine progress in obliterating those slum areas that, like cancer-mangled faces, the sensitive person shudders to see and wishes to cure.

All of these points the committee is planning to cover, and in the next issue of *The Review* we hope to announce the actual speakers. There is in this program an unparalleled opportunity, by taking engineering into homes and homes into the laboratory, to stage one of the most attractive and important conferences ever held at the Institute.

High-Pitched Research

PLANS for a comprehensive joint research program to be carried on in a unique laboratory which has just been completed on the peak of Mount Evans in Colorado were discussed by President Compton and Dr. David Shaw Duncan, Chancellor of the University of Denver, at a meeting last month in Cambridge.

The new laboratory, which stands (see adjacent picture) at an elevation of 14,265 feet, is a joint undertaking of the two institutions. It will be used for cosmic-ray research, meteorological investigations, and studies of the biological and physiological effects of high altitudes. In addition to its use by scientists from the Institute and the University of Denver, it is hoped to make the laboratory available when possible to other scientists who may wish to utilize it for special problems.

The laboratory was erected on the peak of Mount Evans after fabrication in sections in Denver and transportation piece by piece to the mountaintop. It is completely sheathed in copper and was

especially constructed to facilitate cosmic-ray research. Unusual precautions were taken to anchor the building to its rocky foundations because of the terrific storms which break about the peak at all seasons of the year.

It was to this spot on Mount Evans that Professor Ralph D. Bennett of the Department of Electrical Engineering and a group of research assistants went in the autumn of 1935 for preliminary observations of cosmic-ray intensity at this high altitude. Their studies were carried on for several weeks in the face of blizzards, violent electrical storms, and rapid changes in temperature.

Professor Bennett, who has been cooperating with Dr. Arthur H. Compton of the University of Chicago in the design of cosmic-ray recording meters, expects to install one of the instruments in the Mount Evans laboratory next year to study unexplained peculiarities of cosmic rays.

Meantime, the installation of cosmic-ray meters at various world-wide stations is continuing. Last month Dr. Manuel S. Vallarta, '21, of the Department of Physics left for Mexico to join Dr. Arthur H. Compton, who is there to supervise the installation of one of the self-recording meters at a high mountain observatory in that country.

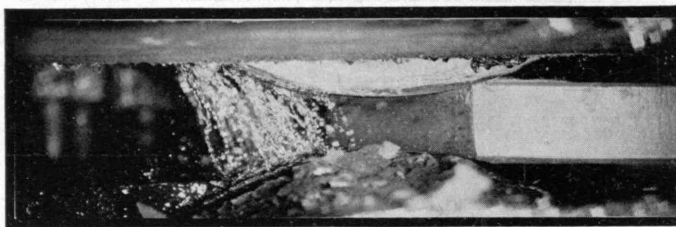
The Corporation Grows

LAST summer, by a change in its by-laws, the Corporation empowered itself to add to its 35 Life Members and 15 Alumni Term Members five special



MOUNTAINTOP LABORATORY

On the peak of Mount Evans in Colorado at an altitude of 14,265 feet, M.I.T. and the University of Denver have built, as related on this page this copper-sheathed laboratory for joint research on cosmic radiation and the biological effects of high altitudes



The four illustrations on this and the opposite page are successive high-speed photographic studies of the rolling of strip steel. Made for the Bethlehem Steel Company, these studies are another example of the versatility of the Institute's high-speed photographic technique

term members.* At its meeting on January 6, the Institute's governing body declared these five new seats filled, named as their holders: Edmund C. Mayo, President, Gorham Manufacturing Company, Providence, R. I.; Gordon S. Rentschler, President, National City Bank of New York; Ralph E. Flanders, President, Jones and Lamson Machine Company, Springfield, Vt.; Frank D. Comerford, President, Edison Electric Illuminating Company, Boston, Mass.; and Halfdan Lee, President, Eastern Gas and Fuel Associates, Boston.

Mr. Mayo is a native of Virginia and was graduated in mechanical engineering from the University of Maryland in 1904. He has been president and general manager of the Gorham Manufacturing Company since 1925. Mr. Rentschler was born at Hamilton, Ohio, and was graduated from Princeton in 1907. In addition to his position as president of the National City Bank of New York, he is a director and trustee of numerous banking and manufacturing companies. Mr. Flanders is a native of Barnet, Vt., and holds honorary degrees from Dartmouth, Stevens Institute of Technology, Middlebury College, Rose Polytechnic Institute, Brooklyn Polytechnic Institute, and the University of Vermont. He has been president of Jones and Lamson Machine Company of Springfield, Vt., since 1933.

Mr. Comerford was born in Worcester, Mass., and was graduated from Holy Cross in 1914. He holds honorary degrees from his own college and Harvard University. In addition to being president of the Edison Electric Illuminating Company, he is also president of Charles H. Tenney Company, and chairman of the boards of the Worcester Electric Light Company and the New England Power Association. Mr. Lee is a native of Norway, and was graduated as a mechanical engineer from the *Ilmenau Politechnicum* in Germany in 1908. In addition to the presidency of the Eastern Gas and Fuel Associates, he is a director of the First National Bank of Boston, the Koppers Gas and Coke Company, and the Montreal Coke and Manufacturing Company.

\$1,491,478

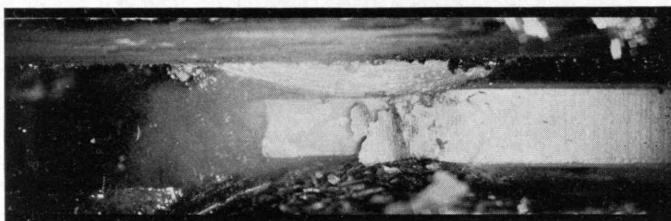
AT the same Corporation meeting on January 6 at which the new term members were elected Treasurer Horace S. Ford announced that gifts received by the Institute since July 1 amount to \$491,478, of which \$335,478 is for general and miscellaneous purposes, while \$156,000 represents additional donations to the Technology Loan Fund. Add to these gifts the Hayden bequest (see page 152) and the total for the fiscal year amounts to \$1,491,478.

*The change in by-laws in no way affects the annual nomination of three term members by the Alumni Association.

First Quarter Million Back

INCLUDING loans authorized for the second term, borrowings from the Technology Loan Fund (see above), established in 1930, now total over \$1,000,000. Particularly gratifying to the board charged with the operation of the Fund, however, is the fact that repayments on principal up to January 16 last were \$250,003.62. This figure represented nearly 80% of the amount due for repayment and, with improved conditions in industry, this ratio will be expected to rise steadily during 1937.

Under the liberal provisions of the Fund, a man is expected to repay at the rate of \$50 every six months



following graduation, but this 80% showing is especially noteworthy in that all of the obligations so far due for repayment have been those of members of the classes not more than five years out of the Institute. Interest is being repaid regularly on the majority of the unpaid notes, and these are considered as extended obligations. It is anticipated that the ultimate collection ratio will be at least 95% of the loans made. Interest received (at the rate of two per cent) up to December 31 last totaled \$55,192.20, which was over three times the unpaid matured obligations upon which extensions had not been granted.

Up to January 16, 1,587 had borrowed from the Fund, and 294 of these had entirely repaid their loans. Many debtors are finding it increasingly possible to make payments in advance, and over \$11,000 of such payments have been received since the close of the fiscal year on June 30 last. It is also of interest to note that loans made have dropped from the peaks of \$202,835 in 1933-1934 and \$203,780 in 1932-1933 to an estimated figure of \$114,000 for 1936-1937. With the coincident rise in the volume of repayments, it is assumed that during 1936-1937 they will be greater than the estimated outgo of \$114,000. Thus in the sixth year of operation the Fund may be said to be revolving.

Military Science

UNDER a change in faculty rules which becomes effective next September for a trial period of two years, conscientious objectors, whose reasons for desiring to be exempt from compulsory military training at the Institute are approved by the Faculty, may substitute certain other studies.

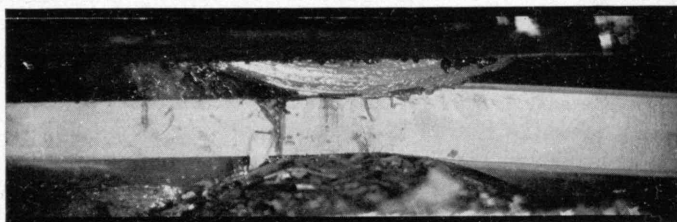
The Institute has required military training since its establishment more than 70 years ago and, in common with the experience of other educational institutions, there have been occasional protests from individual students. The questionableness of compelling conscientious objectors to take military science as a requirement for a degree has been under consideration for some time. As a result, it was decided last month that students whose objections are based on sincere religious or moral grounds should have the opportunity to take subjects other than military science.

Although the alternative requirements have not yet been decided, it is probable that they will include such studies as international law, history of arbitration, or diplomacy, chosen with the approval of a committee of specialists who would set examinations in the various subjects at the end of the first and second years.

Electron Apotheosized

EACH year during the Christmas holidays a year's work in science is brought to focus by the annual meeting of the "Triple-A. S.," the American Association for the Advancement of Science. Last December, at its opening dinner in Atlantic City, this great congress of science heard Dr. Compton, President of the Institute, deliver his valedictory as president of the Association. Fifty years ago the subject of Dr. Compton's address would have been unintelligible because it was unknown; today it makes possible a business totaling hundreds of millions of dollars. His subject: The Electron.

Said he: "The history of science abounds with instances when a new concept or discovery has led to tremendous advances into vast new fields of knowledge



and art whose very existence had hitherto been unsuspected. The discoveries of Galileo, Faraday, and Pasteur are such instances. But, to my notion, no such instance has been so dramatic as the discovery of the electron, the tiniest thing in the universe, which within one generation has transformed a stagnant science of physics, a descriptive science of chemistry, and a sterile science of astronomy into dynamically developing sciences fraught with intellectual adventure, interrelating interpretations, and practical values.

"I take particular pleasure in mentioning these practical values, for even the most unimaginative and short-sighted, hard-headed, 'practical' business man is forced to admit the justification for the pure research — of no preconceived practical use whatsoever in the minds of those who led in its prosecution and of all degrees of success and significance — which has been directed at the electron. For out of

this research have come the following things which all can understand and appreciate: a growing business in manufacture of electronic devices which now amounts to fifty million dollars a year in America alone; a total business of some hundreds of millions of dollars a year which is made possible by these electronic devices; innumerable aids to health, safety, and convenience; and an immense advance in our knowledge of the universe in which we live.

"In science, as in human affairs, great events do not occur without a background of development. The electron had an ancestry which can be traced back through the centuries. Its immediate progenitors were the electromagnetic theory of light, spectroscopy, and the leakage of electricity through gases. First cousins were x-rays and radioactivity and the quantum theory, for, out of a background of long investigation of bewildering and apparently unrelated phenomena, there burst upon the scientific world the x-ray in 1895, radioactivity in 1896, and the electron in 1897 — all while investigators in the older fields of heat radiation and thermodynamics were finding those bothersome inconsistencies in these hitherto respectable subjects which led to that unexpected extension of Newtonian mechanics which we now call quantum mechanics. The concept of the electron, behaving according to the laws of quantum mechanics, is now the basis of most of our interpretation of all that falls under the good old name of natural philosophy."

Dr. Compton then traced the long and complex investigations which finally resulted in identification of the electron and the beginning of its amazing career of usefulness as a servant of man. In his discussion of its social significance, which he characterized as its useful applications, Dr. Compton said: "The first of these was Edison's invention of a thermionic rectifier, based on his discovery that negative electricity would flow across a vacuum from a hot filament to an adjacent electrode but would not flow in the opposite direction. This was some years before the electron was discovered as the responsible agent in this phenomenon. But within a few years after the discovery of the electron, Fleming had shown that this same device will operate to rectify radio wave impulses and thus permit their detection with a sensitive direct-current instrument. From this was patented the Fleming valve.

"Once the basic character of thermionic emission was understood and spurred on by the opportunities opening up in the radio field, new inventions, improvements, and applications of thermionic devices came rapidly. Of major importance was the three-electrode tube amplifier of De Forest. Industrial research laboratories in the communications and electric manufacturing business took the lead in developing techniques and



in penetrating scientific exploration. Noteworthy were the vacuum techniques and the monomolecular layers of activating materials developed by Langmuir and the high-vacuum thermionic x-ray tube of Coolidge. In the Bell Laboratories, oxide-coated filament tubes of good performance were developed and applied particularly to use in long-distance telephony. . . .

"Then, mostly within ten years or so, has come an active introduction of thermionic devices which are not highly evacuated but operate with supplementary action of intense ionization of the gas in the tube. First of these were the low-voltage arc rectifiers, like the Tungar. Most interesting and versatile are the Thyratrons, which permit easy control of powerful currents and machinery, and which give a new means of converting alternating into direct current, or vice versa. In this group also are some of the new types of lamps, of high efficiency or special color.

"Not so striking but equally interesting have been the useful applications of the photoelectric effect. First was the use of sensitive photoelectric cells to replace the eye or photographic plate in astronomical telescopes. Then came sunshine meters, devices to open doors or count people or sort merchandise automatically or to register the speed and license number of the unwary autoist. Most important thus far are the current-producing mechanisms in the sound-movie apparatus and in television equipment.

"While, commercially, radio, sound movies, and long-distance telephony are at present of greatest importance, of no less importance, especially to us as scientists, are the marvelous tools which have been put into our hands for further research in practically every field of science—from physics and chemistry to psychology and criminology.

"So we see how, within one generation, the electron has been discovered and examined, with its aid our intellectual outlook upon the universe has expanded in content and been simplified in basic concept, and in its use mankind has the most versatile tool ever put to use. The end of the story is far from told. Every fact or relationship of the electron appears fuzzy with uncertainties when closely examined, for it can truly be said that every discovery discloses a dozen new problems. The field of practical and commercial uses of electronic devices is certainly still largely in its early stages of exploration.

"This story illustrates in vivid manner a number of characteristics of scientific work, some of which I shall simply enumerate: (1) Progress comes by spurts of advance as some big new idea opens up new territory, alternating with periods of consolidation; (2) progress comes not by revolution or discarding of past knowledge and experience but is built upon past experience and is its natural extension once the vision from new vantage points is secured; (3) there is nothing so practical in its values as accurate knowledge, and the pursuit of such knowledge has been most successful when not fettered with the initial demand that it be directed toward practical ends.

"I would not give you the impression that it is only the electron which has given new life to modern physical science. A story of similar interest could be built around

the new concepts of radiation and atomic energy as expressed in the quantum theory, or about the electron's big brother, the proton, or his rather nondescript cousin, the neutron. In the atomic nucleus is a field of further exploration of enormous promise, now only beginning to be opened up by use of radioactive materials, cyclotrons, and high-voltage generators.

"Although these things have happened very recently, no one has better described the process and intellectual value of this type of scientific research than did Aristotle in the quotation which is inscribed in Greek on the façade of the National Academy of Sciences building in Washington: 'The search for truth is in one way hard and in another easy, for it is evident that no one can master it fully nor miss it wholly. But each adds a little to our knowledge of Nature, and from all the facts assembled there arises a certain grandeur.'"

Achievement Aeronautical

FOR his achievement in inventing the dynamic vibration absorber for aircraft engines, Assistant Professor Edward S. Taylor, '24, of the Institute's Course in Aeronautical Engineering was awarded the Sylvanus Albert Reed Award for 1936 by the Institute of the Aeronautical Sciences. The award, given annually for the greatest advance in aeronautical engineering of the year, is the highest in its field and carries a certificate and the sum of \$250. The selection of this year's recipient was made by the 54 fellows of the Institute of the Aeronautical Sciences and the award was presented to Professor Taylor at the Institute's annual dinner in New York on January 28, just two days after his 33rd birthday.

Professor Taylor, a native of New York City, received his early education at Montclair, N. J., and his Course at Technology was mechanical engineering. After graduation he joined the staff of the Public Service Corporation in New Jersey, later going to the Wright Aeronautical Corporation, which he left to accept a position on the staff of M.I.T. During the latter part of 1934 Professor Taylor was called into consultation by the Wright Aeronautical Corporation to help in problems concerning crankshaft torsional vibration and to increase further the power output of the Wright Cyclone nine-cylinder air-cooled engines. His solution of the problem was the dynamic balancer, which is now used on all Wright Cyclone engines installed in planes of American Airlines, Transcontinental and Western Airlines, and Eastern Air Lines. This mechanism was so successful in reducing crankshaft torsional vibration to a minimum that it was not only adopted for new engines but also was sold in large quantities as replacement equipment for engines already in service.

Visiting Committee Reports

DEPARTMENTAL visiting committees are appointed by the Corporation and in general are composed of two members nominated by the Alumni Council, four from the membership of the Corporation itself, and two selected at large. Twenty-two of these committees with a combined membership of 170 are

now actively serving the Institute by placing at the disposal of the departments their wide experience, their objective judgment of the departments' work and plans, and their strong support in helping the departments to gain approved objectives.

The reports of these committees are published in condensed form from time to time in these pages and provide not only interesting comment on the Institute's educational work but convincing evidence as well of the help which these committees are rendering.

This month, reports are presented on the Department of Chemical Engineering and on the Department of Geology.

CHEMICAL ENGINEERING*

THE Committee report of last year emphasized: (1) the steady growth of enrollment in the Department, especially of graduate students; (2) the importance to continued leadership of a vital research program together with intimate contacts of the staff with industry; (3) strong indications of need for more staff.

This year (1936) the Committee was struck by the continued further growth which has now made the Department one of the largest in the Institute. In three years its enrollment of graduate students has increased from 64 to 114. Also there are 300 undergraduates. The fact that only 20 of the graduate students are graduates of the Institute and that the balance are from 56 widely scattered institutions is but one of many proofs of the acknowledged leadership in its field of the Institute's Chemical Engineering Department.

At the outset it was admitted by everyone that the Department's problems are those of healthy growth but are, nevertheless, acute; that the Department has had the hearty coöperation and support of the administration; that what should be done now is dependent in a large measure upon probable future enrollment, more particularly of graduate students; that the most difficult question is that of the sufficiency of the present senior staff and the office space allotted to it.

The Committee went over the new Institute policy of admitting undergraduates and restricting enrollment and reviewed the Department's own plans for deliberately restricting sophomore enrollment to less than its present size. With these suggestions for insuring the quality of the raw material it is in sympathy. It also considered the possible desirability of restricting the acceptance of graduate students. Here especially it found that the Department was already confining enrollment to promising students. In view of the Department's position in its field, the Committee felt that any restriction which would result in curtailing the number of good graduate students would at this time be unfair to industry and unfortunate for the Institute.

Independently of the Institute administration and the Department staff, the Committee members canvassed their personal opinions as to the probable future call for trained chemical engineers. It was their unanimous opinion that not only are highly trained chemical

* The members of this committee for 1935-1936 were: Bradley Dewey, '09, Chairman, Frank Lovejoy, '94, Henry E. Worcester, '97, Arthur C. Dorrance, '14, Samuel Cabot, '09, George H. Taber, '13, C. M. A. Stine, and M. C. Whitaker.

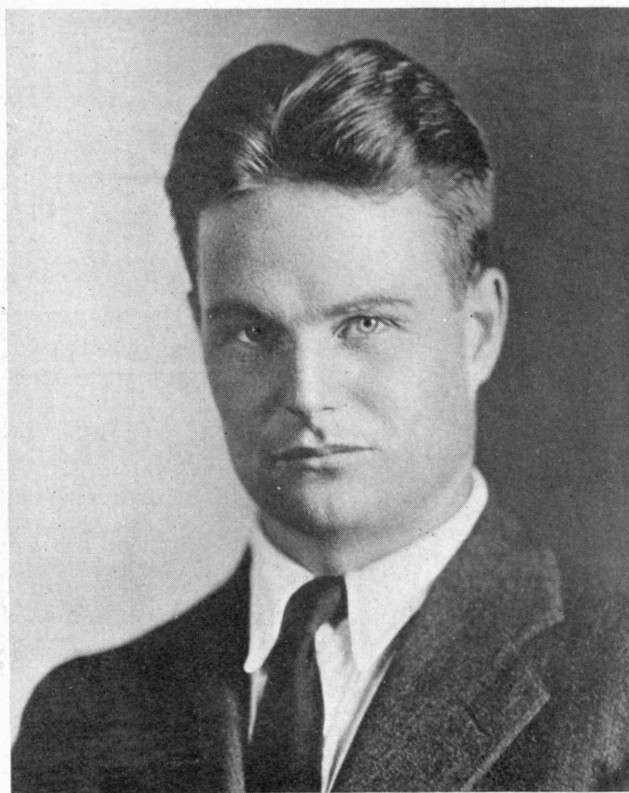
engineers finding opportunities in production, sales, and above all in executive and management positions, as well as research and development activities, in those process industries which have regularly used chemical engineers, but also that more and more industries are constantly recognizing the value of chemical engineers. The Committee unhesitatingly forecasts that the present demand for undergraduate and graduate education in chemical engineering is not temporary, but will grow.

The present-day leadership of the Department is due to many factors: (1) a succession of inspired department heads; (2) a young staff whose interests have been well divided between teaching, fundamental research, and consulting and research contacts with industry; (3) the research developments of one year have been part of the teachings of the next; (4) current researches have been the usual subjects of graduate problems and staff conferences; (5) an ever-present atmosphere of research, combined with amicably adjusted, but often heated staff discussion, has played an important part in building up the Department and its fundamental contributions to chemical engineering literature.

GEOLOGY*

FEW undergraduates major in geology at the Institute. One reason is that few of the students coming to the Institute are aware of (*Continued on page 162*)

* The members of this Committee for 1935-1936 were: Louis S. Cates, '02, Chairman, Charles A. Stone, '88, Harlow Shapley, Bradley Dewey, '09, Frederick G. Clapp, '01, Robert Livermore, '03, Brigadier General Edward M. Markham, and W. C. Mendenhall.



VIBRATION ABSORBER

Edward S. Taylor, '24, Assistant Professor of Automotive Engineering, who has won the Sylvanus Albert Reed Award for 1936. For reasons, more detail, see opposite page

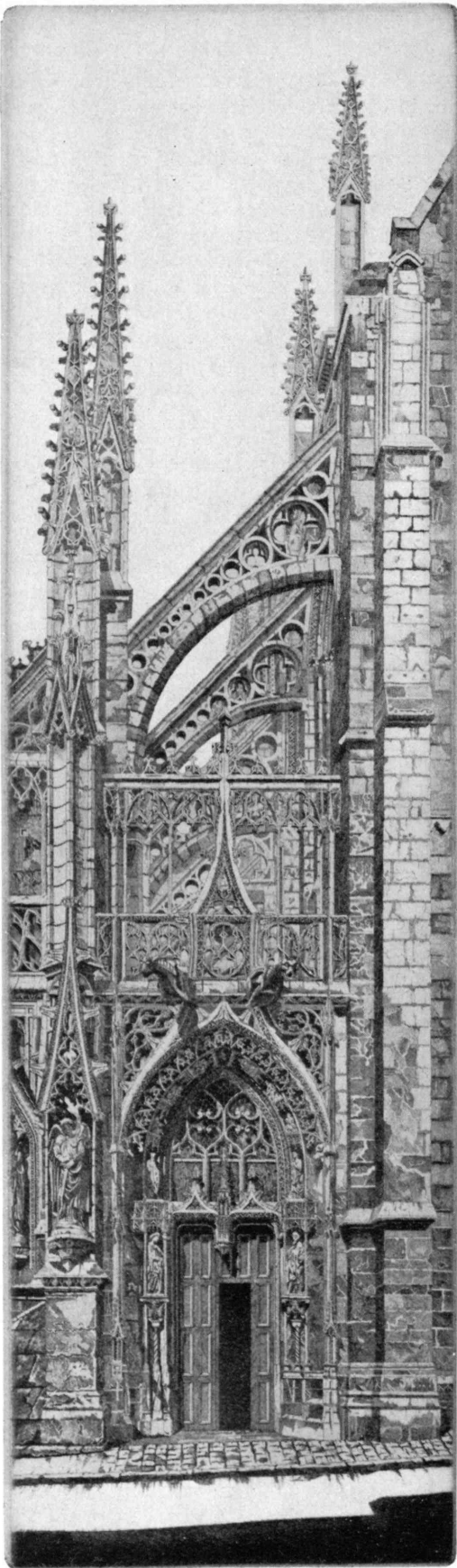
Our Own Etching Show

THE success of the etching show recently staged in New York by the Society of American Etchers, Inc., demonstrated anew that traditionalism, when combined with the utmost in technical perfection, still commands the attention of the art world — this despite the surrealist exhibits which seem to be receiving the lion's share of attention in New York art galleries this winter. Realizing that comparatively few of our readers were able to view the etching exhibit while it was current at the National Arts Club, we decided upon this means of paying homage to Technology's little coterie of etchers, who still keep well to the forefront. In the select group of 156 artists whose prints were accepted for the New York show, four were at one time students at Technology.

For some time the president and leading spirit of the Society of American Etchers has been John Taylor Arms, '11, National Academician and Associate of the Royal Society of Painter-Etchers of England. "Louviers Lace," a slender, graceful plate, which he exhibited at the Society's show, proves once again his amazing mastery of the bitten line and his astounding gift of detail. (See adjacent reproduction.)

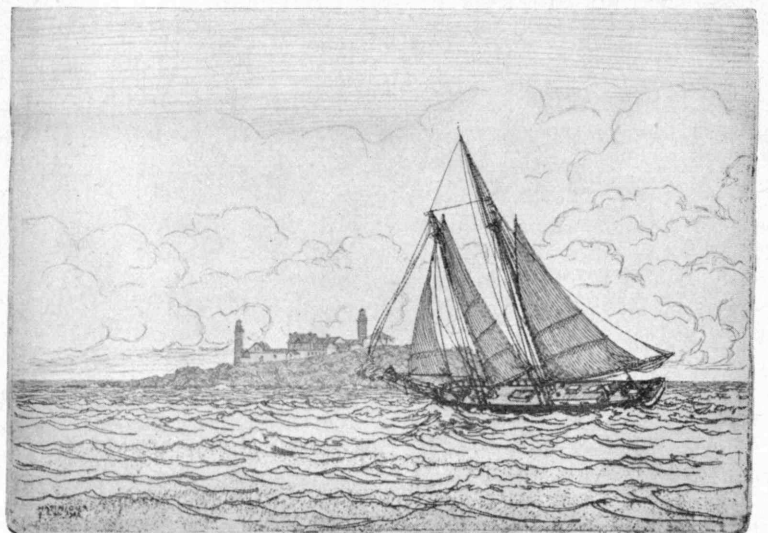
The second vice-president of the Society is Louis C. Rosenberg, '13, who has recently been elevated to the top rank of both the American and English academies. The natural sympathies of this consummate draftsman, who studied with Sir Frank Short, Royal Academician, in London's Royal College of Art, are with the English tradition of etching. Many a London print collector would claim him as England's own. He exhibited a new plate, "Via della Rotondo, Rome," a daring bit of composition, needled in his most dexterous manner. (See opposite page.)

George C. Wales, '89, has the unique distinction of being an architect turned etcher, who etches not architecture at all but boats — and boats exclusively. He is one



ASTOUNDING GIFT OF DETAIL

President Arms's "Louviers Lace." Just this past month, the Grand Central Galleries had an exhibition of the work of this distinguished etcher. Under the title of "Twenty-One Years of Drawing," over 300 items were shown



SURPASSING KNOWLEDGE OF SAIL

George C. Wales's "Matinicus"

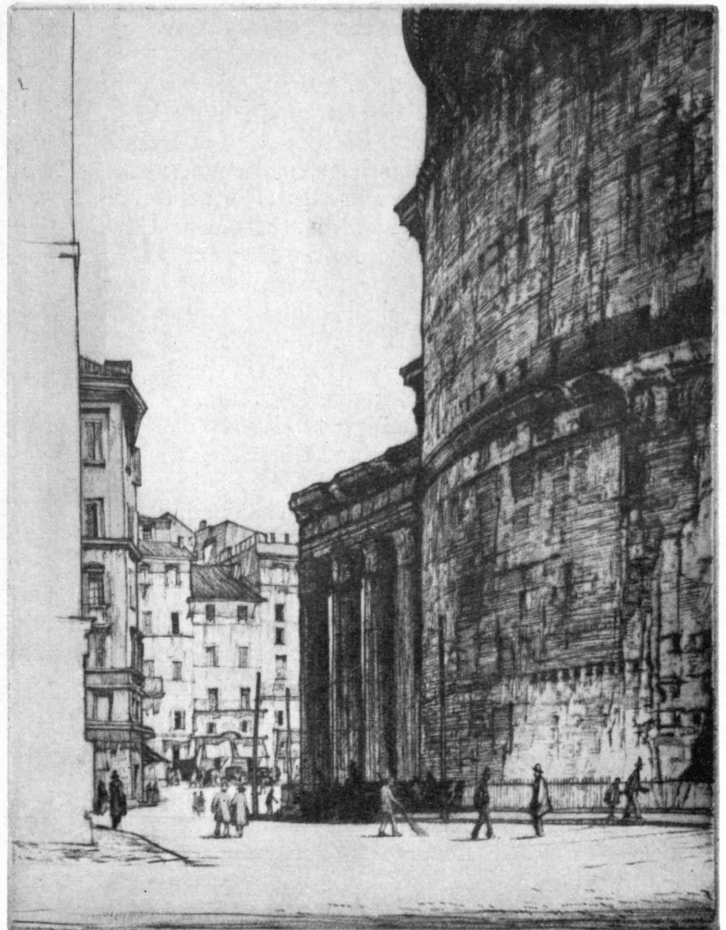


DRAMATIC

Samuel Chamberlain's "Stonington Sunset." Review Contributor Chamberlain's "Summer Street-Marblehead," reproduced in these pages last May, won the Arms Prize for technical execution

of the very few etchers who have a surpassing knowledge of sail and rigging and whose work meets with the approbation of yachtsmen — those sticklers for correct detail. His sensitive little plate, "Matinicus," (on opposite page) proves the point most convincingly.

Of the two dry points exhibited by Samuel Chamberlain, '18, one received the John Taylor Arms Prize for the best piece of technical execution in the show. This was "Summer Street-Marblehead," a calm New England scene which was reproduced in the May, 1936, issue of *The Review*. His other plate was "Stonington Sunset," (above), a dramatic rendition of the Portuguese fishing fleet in this old Connecticut port. Mr. Chamberlain is now giving a course in the graphic arts at M.I.T., and it may not be long before new and younger names are added to the list of Technology etchers.



DARING COMPOSITION

Vice-president Rosenbergs's "Via della Rotondo, Rome"

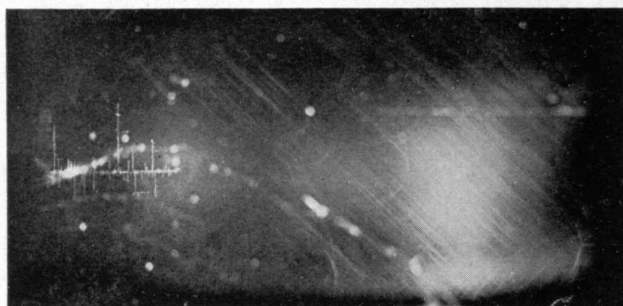


Figure 1. Internal structure of a rock-salt crystal, as revealed by electronic conduction. Islands within the crystal appear bounded by fine light lines

NEVER BEFORE DISCERNIBLE



Figure 2. Streamlining of the flow of electrons from cathode to anode through a crystal, as revealed by the color of copper ions. For explanation see below

THE INSTITUTE GAZETTE

(Continued from page 159)

geology as a professional field. Another is that there is no large elementary freshman course in natural sciences to acquaint them with this field. However, though it would be fine to have more students, the demand today for graduates in geology with only a bachelor's degree is too small, in contrast to those having doctors' and masters' degrees, to warrant any present attempt artificially to enlarge their number. But before leaving the question of undergraduate teaching, it must be emphasized that the Department does a large amount of service teaching for others, particularly for the mining and civil engineers.

As regards graduate students, the situation is very different. The Department has ten graduate students, most of whom are studying for doctors' degrees. All but two of these men took their bachelors' degrees elsewhere, at various institutions in this country and in Canada. Their quality and the institutions from which they come attest the reputation of the Department.

The research activity of the Department covers a wide range. Perhaps its principal emphasis is upon the geology of mineral deposits, but at the same time it is achieving outstanding results in the fields of geophysics, crystallography, and engineering geology.

At the Institute, Dr. Robley D. Evans and Dr. William D. Urry of the Physics and Chemistry Departments, respectively, have improved the techniques for the analysis of the radioactive constituents and related elements in rocks. This type of analysis serves as the most reliable basis for accurate determinations of geologic age. The work of Evans and Urry has placed the Institute far in the lead in this field. Up to the present time the work of Dr. Urry has been financed by funds raised by Dr. Lane of Tufts College, largely by grants from the Geological Society of America.

The analysis of radioactive and related constituents so successfully developed at the Institute is only one phase of the compositional study of rocks. In order to yield maximum output of scientific knowledge, it should be correlated with an equally thorough study of (1) chemical composition through chemical analysis, (2) mineralogical composition through petrographic

analysis, and (3) distribution of the rare constituents among the minerals by spectroscopic analysis. These four simultaneous correlated lines of investigation would constitute an effective attack on one of the most fundamental and relatively untouched fields of research in geology. Such studies would use the accumulated knowledge and techniques of the Departments of Geology, Physics, and Chemistry and should lead to important advances and to a great number of new lines of research. Professor Mead feels that these studies would not involve elaborate new facilities.

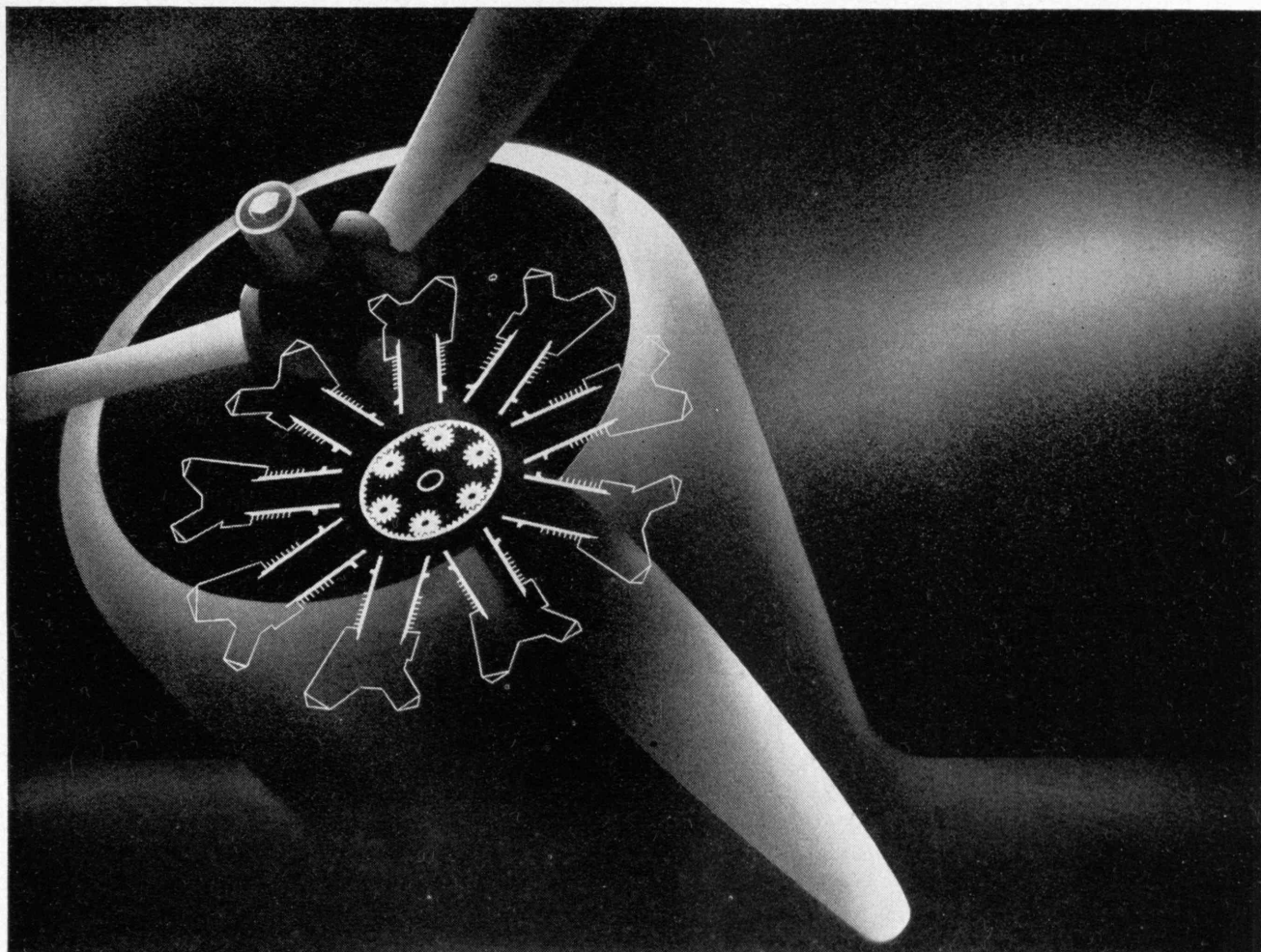
There seems to be no doubt that such a program would place the Institute in a position of prominence in the field of geology and increase the prestige of the Institute as well as of the Department. For a large part of geology it would replace wobbly, rotten, wooden foundations (based in large measure upon insufficient knowledge, sometimes upon guesswork) with real supports. It could not help but be of great ultimate value to economic geology and to more intelligent prospecting for minerals and oil.

Electrons on Parade

CHIEF among factors limiting increased efficiencies in electrical equipment is the inadequacy of present-day insulation. Generators, for example, could be built to produce higher voltages if insulating (dielectric) materials were available that could withstand higher potentials without breakdown. With better dielectrics at the disposal of the electrical engineer, even low-voltage equipment could be improved by reduction in size and weight, and the dielectric storage of energy, as in condensers, could be increased per unit of equipment weight.

The search for better insulation, therefore, is vital in the advancement of the electrical art, and for this reason the Department of Electrical Engineering at the Institute is vigorously carrying forward a wide program of dielectric research. The ingenious technique, described below, of viewing atoms on the march is but one facet of this research, but it is a brilliant illustration of the fundamental scientific (supplementing the equally necessary empirical) approach to an engineering problem.

ATOMIC-PHYSICAL reactions within solids, about which only very indirect, if any, evidence had previously existed, can be (Continued on page 172)



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MOLY

THE FUTURE OF INVENTION

(Continued from page 149)

His Contribution **T O S C I E N C E**

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of endowed laboratories, the chances of a politically dominated research program repairing even a fraction of the damage they have already done seems indeed remote. Even in a democracy, regimentation and governmental control tend to have a paralyzing effect. Inventions depend largely upon the independent thought of active minds and it is difficult to conceive of a fertile field for invention except in an environment which encourages individual independence to the greatest possible degree. The discouraging effect of regimentation might not be so apparent in the first generation, but the effect of a national goose step would certainly show up in the second. Possibly the most serious danger confronting the future of invention throughout the world is this increasing tendency toward regimentation and political domination.

One interesting speculation as to a factor which may in the long run seriously hamper the rate of extension of science and invention is the rapidly increasing length of time required to prepare the average individual to do effective work on the frontiers of science; in other words there is a rapidly increasing amount of prior information which a scientist must master before he is competent to make additional advances. Thirty years ago a man with a bachelor's degree from a good university could carry out advanced research without serious competitive handicap. Today a man with even a doctor's degree is considered to be inadequately prepared to do outstanding research in many branches of science. If this process continues, our men will pass their prime so far as their inventive faculties are concerned before they reach the level where they can begin pioneering work. Some would remedy this by earlier and more intensive specialization in the training of our scientists, but I feel that this would be a serious mistake, as our scientists need to know more, rather than less, of the social implications of their work, and only a broad training can be an adequate foundation for a life devoted to research. This situation can be improved by more efficient methods of education, particularly in the elementary and high schools, for individuals who show real promise of scientific ability. Our present public school system is very wasteful of the time of the small percentage of students who are really brilliant, and we must find some method of discovering this potential brilliance and giving it more expeditious training if we are to maintain the present pace of scientific advance.

Our patent system as a whole has demonstrated its tremendous value as an incentive to research and invention, and its administration has been excellent in view of the many difficult problems it has had to handle. However, our patent system must be expected to evolve as our civilization evolves, and it must be studied to make certain that the restrictions it imposes are no greater than really necessary to accomplish its desired purposes. It is obvious, of course, that every invalid patent whose issuance the Office permits or a court orders, and every unnecessary delay which occurs in the prosecution or adjudication of a *(Continued on page 166)*



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BELL TELEPHONE SYSTEM

THE FUTURE OF INVENTION

(Continued from page 164)



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patent is an undesirable and unnecessary burden on both science and industry. Anything which can be done to make the process of granting patents more expeditious and more reliable is highly desirable. I have studied with interest and care the report of the committee of the Science Advisory Board on the relation of the patent system to the stimulation of new industries and concur heartily with its recommendations, particularly as to the desirability of, and the methods recommended for, increasing the presumption of validity of issued patents and making possible the more expeditious handling of cases both within and without the Patent Office. It is indefensible when, as has happened on several occasions, a patent issues after 10 or 15 years in the Patent Office and purports to dominate an industry which has sprung up in the interim. The hazard of such an occurrence is always hanging over legitimate industry and this ever-present possibility is probably, in the long run, more harmful than in the rather rare cases in which it does occur. In any case effective steps should certainly be taken to make such occurrences impossible. Just as the development of new inventions is requiring men of higher caliber, so the caliber and training of Patent Office personnel must continue to improve, their salary and average tenure of office should be increased, and some means taken to make examiners more familiar with the general background of unpublished information and practice in our industries.

Now that a greater and greater proportion of our inventions and discoveries is made as the result of planned attack by our large industrial laboratories, it is apparent that the domination of a new field of invention by basic patents issued to one company is necessarily a deterrent to other companies who might otherwise enter this field of investigation. Actually, however, experience has shown that even comparatively late comers in such new fields can reasonably expect, if they prosecute their research vigorously and intelligently, to find alternative methods or improvements which will entitle them to a place in the picture. Some one has given this process the apt name "circuminvention." It is also true that in many cases changing conditions in an industry cause numerous laboratories to start work almost simultaneously along similar lines and in this case the existence of our patent system is definitely a stimulus to speedy and effective research; there is frequently a race to see which group can secure the best patent position. Unfortunately the ultimate result of such a race is generally the issuance of a considerable number of overlapping or supplementary patents so that the process which is ultimately found to be best frequently infringes or appears to infringe the patents of several different individuals or companies, and many other applications are tied up in interferences. Fortunately there has been an increasing tendency in recent years for companies in such a position to avoid the expense and delay attendant upon interference and infringement litigation by arbitrating their interference and exchanging cross licenses to both past and future developments in a given narrow field. (Continued on page 168)

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THE FUTURE OF INVENTION

(Continued from page 166)

Such an agreement generally involves provisions for the licensing of others upon reasonable terms and for a division of royalties based upon the best estimate of the parties as to the relative value of their respective positions. Such agreements also usually involve agreement by each party to conduct further research in the field in question.

There have been several recent attempts to arouse opposition to such arrangements, labeling them as "patent pools," without any real attempt to study their provisions. Certainly the ordinary cross-licensing arrangement among companies actively engaged in research can serve only to remove part of the barriers to use originally set up by the patent system, thus removing obstacles both to research and to commercial development and decreasing wasteful litigation. It makes enough patents and (what is frequently more important) combined experience available to a licensee so that he can really operate the best available process without having to acquire licenses from several different sources. Such licenses in general protect the licensee not only from issued but from all future patents in the defined field which might issue to any of those in the cross-licensing group. The only party which would seem to have any cause for complaint against such an arrangement is the racketeer who hopes to infringe with impunity while the owners of the patents fritter away the life of their patents in lengthy and often suicidal litigation with one another.

Since such cross-licensing agreements definitely tend to promote not only research and invention but the prompt commercial application of these inventions, the question might be raised as to why cross-licensing agreements covering entire industries would not be still better in this respect. Such arrangements have been tried in a number of industries and in general they have not been successful for any considerable period. Apparently the main difficulty has been that they have run up against human nature: As soon as any individual or company realizes that all its competitors will have the same rights as it has to anything it may develop, there is a natural tendency to leave the expense of research and development to one's competitors and hope to acquire a "free ride." Other companies which, as a matter of principle, continue their research become irritated sooner or later when the fruits of their research are appropriated by others who have contributed nothing. In general, cross-licensing agreements have been successful only where they were either backed by a definite agreement to contribute ratably to support most of the research in the field, or have been made between individual companies who have confidence in one another's desire and ability to contribute their share to the heavy expense of research and development.

Concentrating as I have on possible threats to the future of invention, I hope I have not given the impression that I am pessimistic with regard to its future. My purpose has rather been to point out that the growth of science and invention is not something which we can rely upon to continue auto- (Concluded on page 169)

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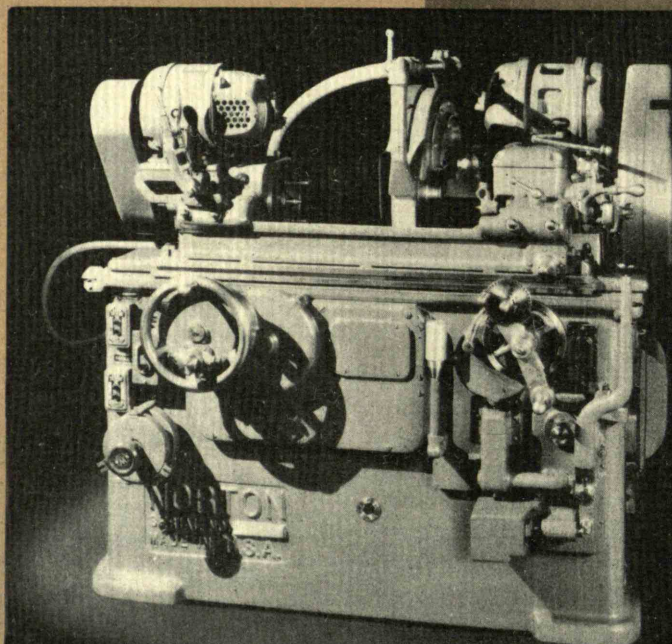
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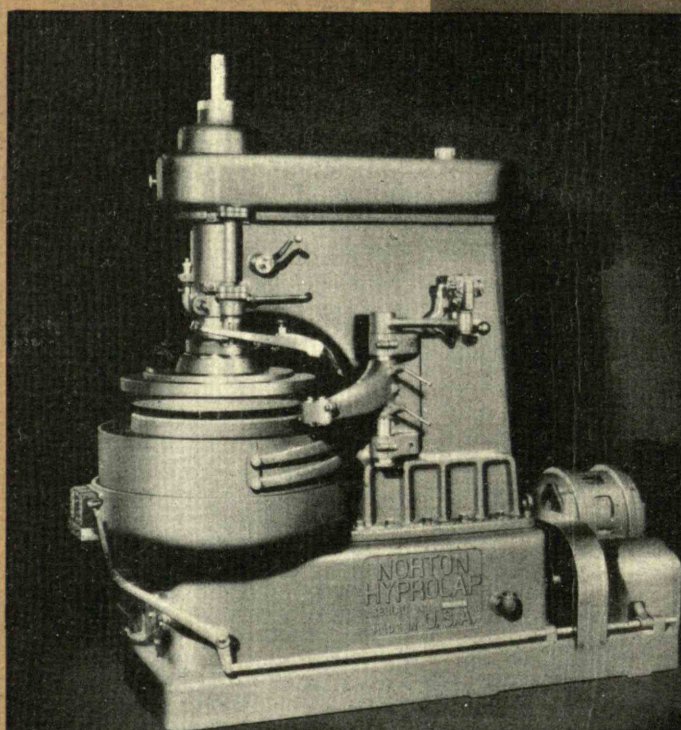
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Hyprolap, Cam-O-Lap and Crank-O-Lap are Norton trade-marks.

NORTON MACHINES

THE FUTURE OF INVENTION

(Concluded from page 168)

matically without any effort or attention on our part. Our inventors and scientists are probably our greatest national asset and one which we must foster and conserve if we are to retain it. Incentives to invention must be maintained, and obstacles removed. Of the future of research and invention in the European dictatorships I am seriously apprehensive, but of their future under our American democracy and a reasonably evolving patent system, I am not only optimistic but enthusiastic. This is not the end; the future of invention will dwarf its past.

SCIENCE AND AMERICAN LITERATURE

(Concluded from page 154)

which Dos Passos borrowed from the movies, Dreiser's pseudophilosophic chemism, Cabell's flight to Poictesme, Robinson's determined preoccupation with the unmachined backwaters, Hemingway's desperately objective analyses of war's human by-products are precipitates of the same reagent. In the immediate present, both Sinclair Lewis' "It Can't Happen Here" and the political system which it attacks would be physically impossible without the public-address system provided by engineering. The pleasant sophistication of S. N. Behrman's politely futile loafers and the grim desperation of Clifford Odets' ominously radical workers are products of the same machines.

The generation of new subject matter is not the only way in which science has served, well or ill, recent American literature. Beyond altering the setting and the characters with which a creative writer deals, science has changed the very style and method with which he works. The objective technique of the laboratory is, as Hemingway himself asserts, the most efficient and, therefore, the most desirable way of fixing for a moment a sequence of human activity, according to one school of creative thought. At the other pole, the nebulous concept of a time-space continuum of multiple dimensions, no beginning and probably no end, finds its literary prototype in the stream-of-consciousness, godchild of Einstein and Freud.

No time is needed to show that the immanence of science in American life today is producing a literature that cannot be explained in the older terminology. Even if the historical importance of the older influences could be extended to explain and evaluate current literature, there is nothing in their history to justify hope for their continuance. Literary criticism in America in the century to come must be ready to reckon with a science that is not only dominant but also self-conscious.

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WHERE PRINTING IS STILL A

Craft

✓ CHARLES HAYDEN, '90

(Concluded from page 152)

Later, when the Corporation decided that the Institute's greatest need was a great loan fund, Mr. Hayden again played a major part in raising and administering the fund, and contributed \$150,000. Two years ago, with the Loan Fund in successful operation, the Institute found need for additional research funds and again Mr. Hayden lent active aid by becoming chairman of the Research Associates.

In many other Institute enterprises his counsel and help were sought and obtained in the fullest measure. Always he seemed to be dominated by the feeling that "life is but a little holding, lent to do a mighty labor," and by the indefatigability with which he worked and built and helped, he demonstrated how mighty one man's work can be. Despite his tremendous responsibilities, he remained throughout his life, as he impressed his classmates when an undergraduate at Technology, a gracious, highly social, friendly person.

Mr. Hayden's rise to a dominant position in the financial world began almost immediately after his graduation. In February, 1892, he organized, with Galen Stone, the firm of Hayden, Stone and Company and became, when only 21, a member of the New York Stock Exchange. At that time the primary interest of Mr. Hayden and his firm was in copper companies as a result of his vision of the expansion to come in the electrical industry. The firm financed many new copper enterprises, and Mr. Hayden eventually became chairman of the finance committee of the Kennecott Copper Corporation and its subsidiaries, Nevada Consolidated Copper Corporation and Utah Copper Corporation. At the time of his death he was on the directorates of more important companies than any other man in the United States. In addition to copper, the industrial enterprises in whose management Mr. Hayden participated included nickel, shipping, sugar, investment trusts, office equipment, fertilizer, baking, cement, oil, railroad equipment, textiles, trucks, elevators, hotels, and insurance.

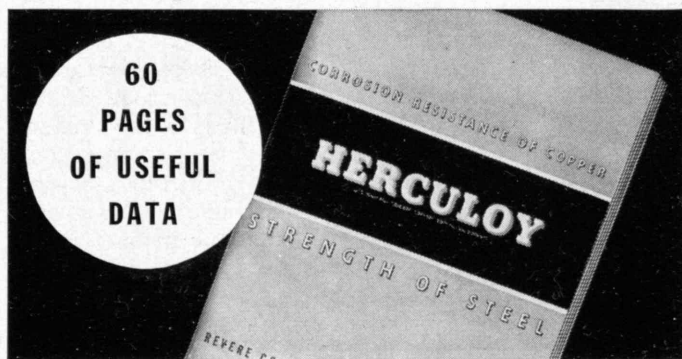
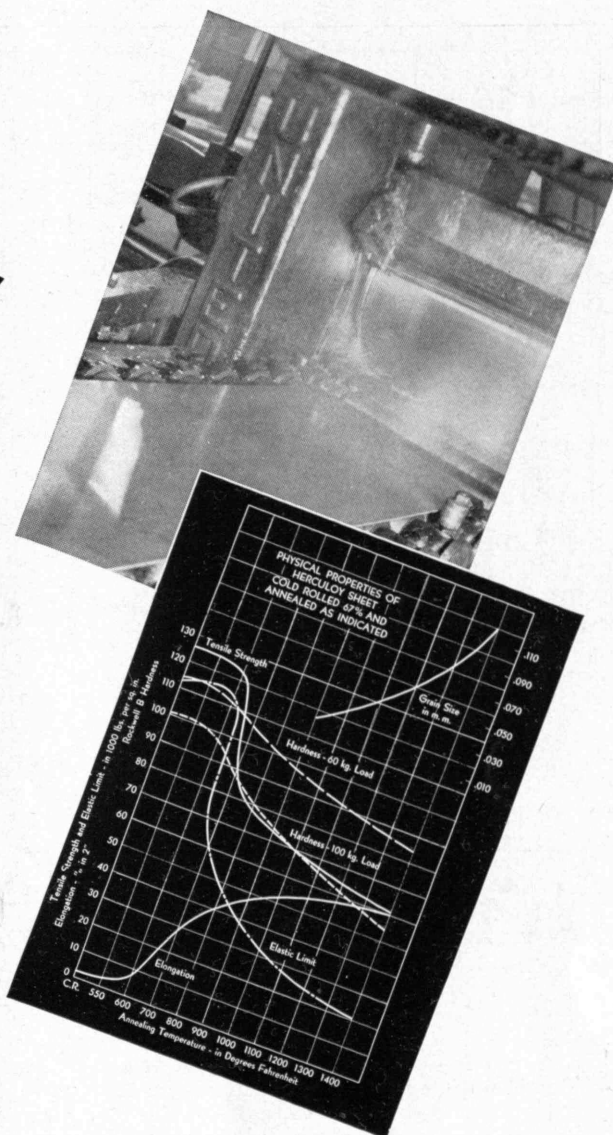
In addition to his many gifts to the Institute, Mr. Hayden during his lifetime generously aided divers good causes. His gift of \$150,000 for the completion of the New York Planetarium, which now bears his name, and his leadership in 1935 of the United Hospitals Campaign were probably the best known of his recent philanthropies. Through the Charhay Corporation created by him he systematically supported many charitable organizations, particularly those contributing to the needs of youth. The foundation established in his will insures the perpetuation of this carefully conceived aid.

Mr. Hayden's death calls attention anew to the large and impressive group of Technology graduates who have become major figures in American industry and who have combined with their financial genius deep understanding of the social needs of our time and the will and vision to make permanent contributions to the welfare of American life. Certainly this group, as Mr. Hayden has specifically demonstrated, has helped to build the Massachusetts Institute of Technology, and to make it an ever greater institution through their intelligent loyalty and understanding support.

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THE INSTITUTE GAZETTE

(Continued from page 162)

visibly demonstrated as a result of studies conducted by Professor Arthur R. von Hippel of the Electrical Engineering Department at the Institute. Dr. von Hippel is continuing at Technology a program of research into electronic and ionic conduction through solids and into the electrical breakdown of insulators, which he began some years ago at the University of Göttingen.

Dr. von Hippel's latest investigation had its starting point in the observation of Stasiw at Göttingen, who found that in a crystal of rock salt, heated to about 500 degrees C. and placed between electrodes, a cherry-red cloud appears at the cathode side — as current is passed — and passes through the crystal. Its rate of progress is much faster than that at which ions could move through the medium, so that some other explanation for the phenomenon on an electronic basis is necessary. This Dr. von Hippel has found. He has been able to show that electrons enter the crystal, move along in preferred crystallographic directions, and slow down and become trapped by the local distortion of the crystal-lattice which they themselves bring about. As a sign of their local stoppage in the crystal, the color appears. Heat vibration, however, after some time breaks the binding force, the electron moves some distance but becomes trapped again, and consequently the color-cloud moves along also, showing the points where electrons are caught.

Characteristics of the internal structure of the crystal, including failures in it, which never before were discernible, are made clearly evident as a result of this technique. The color produced by the electrons is sensitive to imperfections in the structure, as appears in Figure 1, (page 162) where boundaries of internal areas within the crystal, corresponding in a sense to fault lines in the earth's crust, are seen.

In another way also Dr. von Hippel's study makes it possible for the investigator to get inside the crystal and observe what is going on during the passage of a current. The electrons act like a developing solution to reveal the presence of ions which do not belong in the original crystal.

Copper ions, for instance, which enter from a copper anode and which would otherwise be invisible in the space-grating, are in a sense dyed, in a manner somewhat resembling the staining used in microbiology, by becoming linked to electrons and as a result indicating their presence by a pink color at the place where they are fixed. Conversely, because the copper ions thus show the presence of electrons, they can be used to show the outlines of the electron current. Their pinkish color performs for the electron flow the same function that ink

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performs in indicating the flow of water to an orifice, high lighting the streamlines within the crystal as the dye marks streamlines in hydrodynamic experiments. Figure 2 illustrates this effect.


Through the method established by Dr. von Hippel's research, other phenomena hitherto necessarily known only in theory can be raised to the visible level. Among these are the stability of chemical compounds in the crystal, and the phenomenon of impact ionization, which destroys insulating material by an electric breakdown. This last is of special practical importance, for if the mechanism involved in such breakdowns is learned, remedies for it may be devised and better electric insulators designed.





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THE TREND OF AFFAIRS

(Concluded from page 145)

with a free period of the shorter duration. Later it was found that a similar wave caused by the great Siberian meteor in 1908 was propagated with the same speed.

A hint of the final answer was found in yet another difficulty. This arose in connection with the use of the so-called dynamo theory to interpret diurnal variation of the earth's magnetic field. According to this theory, the oscillation of the atmosphere across the permanent magnetic field of the earth causes electric currents to circulate in the Kennelly-Heaviside layers—strata of ionized air in the upper atmosphere—and these currents in turn produce a magnetic field which we observe at the ground as a small oscillation in the magnetic field of the earth. But the variation in sign of this magnetic field, it was shown by Chapman in 1919, is such that it can occur only if the atmosphere aloft swings in the opposite direction to the atmosphere below.

The clue to the solution of this problem was found by Dr. Pekeris in the anomalous propagation of sound from gunfire. It has been known since the World War that there are two zones of audibility, one within a radius of 30 miles from the source and another between 60 and 90 miles. Between them is the zone of silence which caused firing at the recent exercises of the Pacific Fleet to be heard at inland stations but not along the coast.

Dr. Pekeris' explanation of this phenomenon is that sound waves are speeded up and bent downwards in the upper atmosphere by a hot layer, much as radio waves are reflected by the conducting layers. If the existence of the hot layer be assumed, it is found that the atmosphere would have two periods of oscillation: 10½ hours and 12 hours. In the atmospheric mode having a period of 12 hours, there is no oscillation at the height of 20 miles; the atmospheres above and below that level swing in opposite directions. Without the hot layer above, however, this mode of oscillation could not exist in the atmosphere. Assuming the hot layer, we have a synthesis of Kelvin's 12-hour period, Chapman's weak lunar tides, Taylor's 10½-hour period, and Chapman's varying magnetic field conditions by opposing atmospheric swings, as well as an explanation for the zone of silence in the propagation of sound.

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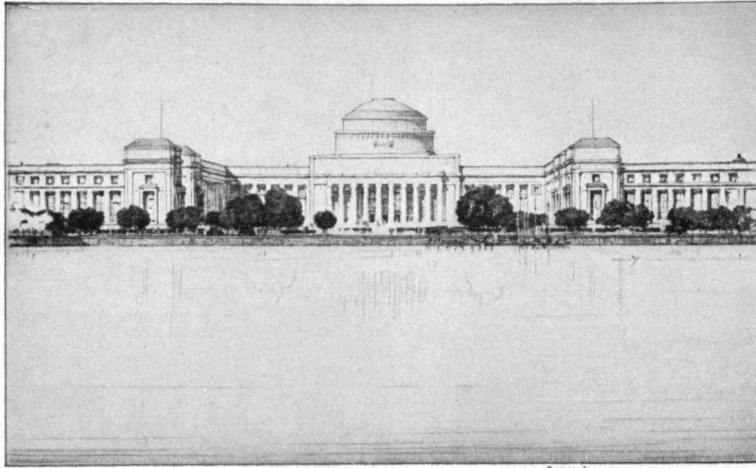
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CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

Newsprint Notes

¶ That HENRY M. HOBART '89 has been awarded the Samuel Wylie Miller Memorial Medal by the American Welding Society. Mr. Hobart is an authority on arc welding, design of dynamo-electric machinery, insulation, and standardization.

¶ That GERARD SWOPE '95, President of the General Electric Company, made a year-end statement: "As the increased use of electricity continues, there will be a decrease in the margin of surplus generating capacity. Hence it will be necessary for the utilities to increase their plants . . . and to restore general employment in capital goods industries." Mr. Swope pointed out that the United States uses more than four times as much electric power per person as the rest of the world, with domestic consumption of electricity reaching a new peak in 1936.

¶ That GEORGE B. HARRINGTON '04, President of the Chicago, Wilmington and Franklin Coal Company of Chicago, was elected a director-at-large of the National Coal Association early in December.

¶ That CARLE R. HAYWARD '04 was reelected chairman of the state executive committee of the Young Men's Christian Associations of Massachusetts and Rhode Island on December 10.

¶ That CLARENCE D. HOWE '07, "born American, naturalized Canadian, is full of a burning urge to make things go." We have referred previously (January, 1936) to Mr. Howe's position as a cabinet officer in the Canadian government. That he continues to be efficient and popular after a year in office is amply testified by an interesting sketch entitled "Canada's Busiest Man" in the *Winnipeg Free Press*, December 21.

¶ That THOMAS C. DESMOND '09 was suggested for minority leader of the New York state senate at the conference of Republican senators-elect on December 19.

¶ That ROBERT E. WILSON '16, author of an article in this issue, assisted in the ceremony on January 8 in which the Perkin Medal for 1937 was presented to Thomas Midgley, Jr., at a joint meeting of the American section of the Society of Chemical Industry and the American Chemical

Society in New York City. In accepting the medal Mr. Midgley gave credit to several scientists for their aid; among them was ALBERT L. HENNE '26 for his work in the development of the organic fluoride refrigerants.

¶ That EDWARD N. WENDELL '25 was landed at Marseille on November 29, having escaped from Spain with other American employees of Spanish concerns. There seems to have been a general exodus of Technology men from Spain; among them JOSEPH SERRALLACH '34, who has gone to Italy.

¶ That WALTER C. VOSS '32 was appointed to the planning board of the town of Wellesley, Mass., on December 23, at a joint meeting of the selectmen and the planning board.

¶ That OLIN J. STEPHENS '30 is the youngest man to be intrusted with a commission as codesigner of a yacht that will compete for the America's Cup. He is working alongside of W. STARLING BURGESS, lecturer at M.I.T. in 1934, who created the J boats, *Enterprise* and *Rainbow*.

Addresses and Broadcasts

¶ By WILLIAM D. COOLIDGE '96, over station WGY, November 26, one of the General Electric science forum broadcasts, on the contributions of science toward making life more livable. It is not necessary to point out in a scientific publication how manifold are these contributions, but we present Dr. Coolidge's conclusion: "If our forefathers could find, in the midst of hardship, danger, and deprivation, much to be thankful for, surely we should not fail to appreciate our much greater blessings, nor should we fail in our grateful appreciation of the accomplishments of science to which we owe these blessings."

¶ By EDGAR E. HUME '21, at the joint session of the American Historical Association and the History of Science Society in Providence, R. I., December 30, an address, "The History and Work of the Army Medical Library."

¶ By KARL T. COMPTON, President, at the Public Utilities Forum of Investment Bankers Association in Augusta, Ga., December 5, an address, "The Public Interest." Dr.

Compton approached his subject by considering "what conditions will best promote those technical developments which will give the best service to the public five, ten, 25 years hence."

Aeronauts' Round Table

A joint meeting of the Institute of the Aeronautical Sciences, the American Society of Mechanical Engineers, and the Society of Automotive Engineers was held in New York City on December 4 as a prelude to a dinner honoring Dr. George W. Lewis, winner of the Daniel Guggenheim Medal. The round-table discussion was conducted under the leadership of JEROME C. HUNSAKER '12, and among other participants were B. C. BOULTON '16 and CHARLES F. TAYLOR '29. LESTER D. GARDNER '98, Secretary of the Institute, read a paper by the air *attaché* of the Italian embassy. In the evening the presentation of the medal was made to Dr. Lewis by E. E. ALDRIN '17, President of the Daniel Guggenheim Medal Fund. Tributes to the scientific achievements of Dr. Lewis were paid by many eminent men; among them, CHARLES G. ABBOT '94, Secretary of the Smithsonian Institution, and E. P. WARNER '17, representing the National Advisory Committee for Aeronautics.

Written

¶ By CHARLES B. BREED '97, an article, "Long-Time Road Planning," *Engineering News-Record*, November 26. Professor Breed states: "Every road that is traveled contributes [through gasoline taxes] something toward the total tax collected in the state. . . . The distribution of funds cannot be made to each road individually, but the distribution as between classes or systems of highways should bear some relation to the use made of them. This distribution should be based on complete traffic data. As time goes on these data are becoming more and more complete."

¶ By JOSEPH H. KEENAN '22 and FREDERICK G. KEYES, Staff, a book, "Thermodynamic Properties of Steam," John Wiley and Sons, Inc. This is an accurate and inclusive compilation of steam tables, based on

the latest available experimental work in America and abroad. For the first time a table is presented which extends continuously from vapor to liquid states above the critical point.

¶ By C. C. CASH '30, an article, "Protection Against Lightning Interference," *Bell Laboratories Record*, December. According to Mr. Cash direct lightning strokes on communication lines rarely occur, but disturbances may result from inductive effects caused by thunderstorms, sometimes many miles away, unless these disturbances are effectively guarded against. Dissymmetry between the two protectors on a pair of wires allows a pulse to appear in the circuit when the lightning currents discharge through the protectors. To minimize these surges, it is necessary either to prevent the protector blocks from breaking down or to apply circuits which force them to operate in a symmetrical manner. One such method involves the use of drainage coils to prevent protector breakdown and this method is described in detail by Mr. Cash.

¶ By THEODORA KEITH '32, an article on East Poultney, Vt., the *Boston Herald*, Sunday, December 6. This was written on the occasion of the 150th anniversary of this "peaceful old-time village" which has "roused from its century of sleep to a revived appreciation of its architectural and historical treasures."

¶ By KARL T. COMPTON, President, a brief statement in *Banking*, December, Section One: "In some . . . industries, earnings have been so exclusively taken out as profits and so little has been put back into the business for development and research that plants and methods have become obsolete. . . . The longer an effective scientific approach is delayed, the more serious will be the situation."

DEATHS

* Mentioned in class notes.

¶ Errors of any description are unfortunate, but misstatements dealing with vital statistics make The Review most unhappy. With apologies and humiliation we wish to correct our statement made in the November issue concerning ALBERT F. SCHAAD '27, who happily is still alive. This confusion was brought about through the death, in June, of GEORGE C. SHAAD, who was a member of the Department of Electrical Engineering from 1906 to 1909.

¶ PHILIP D. BORDEN '73, December 24. Mr. Borden died the day after celebrating his 86th birthday. From the *Boston Herald*, December 27, we quote: "Shortly after leaving college he entered the employ of the city [Fall River] and served for 30 years until his retirement 20 years ago. He was a charter member of the Fall River Historical Society and a Mason. Surviving are a widow, Mrs. Abbie Lincoln Borden, and a daughter, Mrs. Ernest R. Adams of Newton Highlands."

¶ STEPHEN H. BENNETT '86, December 18. From the *Boston Herald*, December 20: "Bennett was the son of the late Stephen D. and Ellen Howe Bennett. He was born in Cambridge and educated at the Chauncy Hall School. He was graduated from M.I.T. . . . He married Miss Margaret Darlington of Pittsburgh in 1893. She died in 1915. He was a member of the Boston Stock Exchange and one of the early members of The Country Club, Brookline. He was formerly a member of the Tennis and Racket Club. He is survived by: three daughters, Mrs. Edward Cunningham of Dedham, Mrs. C. T. O'Callaghan of London, England, and Mrs. B. L. Wells of New York; a sister, Mrs. Charles F. Richardson of Brookline; and five grandchildren."

¶ PAUL WINSOR '86, December 10. From the *Boston Evening Transcript*: "Mr. Winsor . . . attended Milton public schools and was graduated from M.I.T. with the Class of 1886. He then became associated with the Pennsylvania Railroad. In 1900 he became affiliated with the Boston Elevated as chief engineer of motive power and rolling stock, and later was appointed chief engineer of the mechanical and electrical departments of the entire company. He held membership in the Engineers Club of Boston, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, Florida Engineers Association, and the Engineers Club of New York." Among Mr. Winsor's survivors is his sister, Mrs. Henry G. Pearson of Newton Centre, wife of Professor Pearson of the Institute's Department of English and History.

¶ EDWARD P. QUIGLEY '88, December 4.

¶ HENRY G. YOUNG '89, December 5.

¶ EDWARD HOBART '92, December 10.

¶ WALTER E. KIMBALL '98, December 2.*

¶ THOMAS E. PENARD '00, October 26.*

¶ GEORGE V. POTTLE '01, date not known.

¶ ROBERT A. POPE '02, December 15.*

¶ GEORGE C. THOMAS '05, December 2. After leaving college Mr. Thomas became associated with the Singer Manufacturing Company of Bridgeport, Conn., where he advanced rapidly. From the *Boston Traveler*: "During the World War he was sent to Russia, where he was superintendent of the plant of the Singer Manufacturing Company in operation there. With the outbreak of the Russian Revolution he returned to the United States and became associated with the United Shoe Machinery Corporation. In 1925 he became general superintendent of the unit. He was later made assistant vice-president."

¶ CHARLES W. MOWRY '06, December 19.* We quote the *Boston Evening Transcript*: "Born in Fall River, a son of William I. and Mary Dickinson Mowry, he attended the public schools there and later was graduated from M.I.T. . . . He entered the inspection department of the Associated Factory Mutual Fire Insurance Companies. In 1928 he was made manager of the inspection department. Mr. Mowry was an authority on the design and operation of automatic sprinklers and other safety devices. He was an editor of the *Factory Mutual Record*, an organizer of the Everett Testing station of the Factory Mutual Laboratories, and a director of the National Fire Protection Association. He held membership in the New England Water Works Association, American Water Works Association, American Society of Mechanical Engineers, Boston Chamber of Commerce, and the Golden Fleece Lodge of Masons, Lynn. He served as chairman of the board of trustees of the Central Congregational Church of Lynn and was a frequent contributor to various engineering journals. He was also an honorary member of the New England Association of Fire Chiefs and a recipient of the Dexter Brackett Memorial Medal of the New England Water Works Association. . . ."

¶ W. ROWE McCUNE '11, December 1.*

¶ VERNON G. SLOAN '12, December 27.

¶ GEORGE M. DENKINGER '22, December 21. Mr. Denkinger was a member of the Department of Aeronautical Engineering from 1917 to 1919 and again from 1921 to 1922. While at M.I.T. he helped design and build the wind tunnel for testing model airplanes.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

M.I.T. Women's Association

On December 2 the Association held a supper meeting in honor of the birthday of the late Ellen H. Richards '73. Speakers at this meeting were: Alice G. Bryant '86, A.B., M.D., F.A.C.S., A.S., E.I.E., who read a paper on Mrs. Richards and her place in the world of science; Mrs. Frederick T. Lord '98, who gave excerpts from the Misses Hyams' and Stern's compilation of the sayings of Mrs. Richards. Mrs. Karl T. Compton was our guest at this interesting meeting.

Following the speeches a game of jingles invented by Marjorie Pierce '22, Vice-president of the Association, tested our knowledge of personalities in the news. The winners of this contest were Eleanor Manning O'Connor '06 and Gretchen Van Stratum '39, a student of architecture. The evening ended with the singing of Christmas carols. — GRACE G. FARRELL '29, *Secretary*, 17 Kahler Avenue, Milton, Mass.

Technology Club of Albany

A dinner meeting of the Club was held at the University Club on Friday evening, December 11. Our guest and speaker, B. Alden Thresher '20, Director of Admissions, was introduced by B. R. Rickards '99, an Honorary Secretary of M.I.T. Professor Thresher spoke on the Institute, stressing particularly the problems of the Admissions Department, of their efforts to stabilize enrollment and at the same time obtain the highest type of student. Previous to meeting with the Club, Professor Thresher visited several high schools in this area with B. R. Rickards.

The following members were present: A. F. Allen '12, J. G. Fairfield '16, J. H. Finley '25, G. A. Noveck '22, B. R. Rickards '99, A. E. Robinson '28, E. H. Sargent '07, W. D. Scofield '23, I. J. Smith, Jr., '22, W. A. Wilber '34, R. E. Walsh, Jr., '28, C. H. Wood '91. — REDMOND E. WALSH, JR., '28, *Secretary*, New York Power and Light Corporation, Albany, N. Y.

Technology Club of Northern Texas

The Club held its annual meeting at the Dallas Athletic Club on November 19. H. E. Lobdell '17, Dean of Students, and H. B. Richmond '14, Vice-president of the Alumni Association, were the principal speakers. Following the dinner a very interesting discussion was held, in which all present participated, concerning the present activities of the Institute, and particular interest was manifested in the new policy with regard to the selection of students. Frank F. Bell '10, Honorary

Secretary for Dallas, gave an account of the work he has been doing in an endeavor to obtain a more representative group of students at the Institute from northern Texas.

At this meeting the following officers were elected: George R. Prout '22, President; Count B. Capps '20, Vice-president; E. G. Senter, Jr., '17, Secretary; Board of Governors: Olin W. Scurlock '21, Peyton G. Cooper '34, and Samuel W. Marshall, Jr., '28.

Those in attendance besides Messrs. Lobdell, Richmond, and Bell were: Olin W. Scurlock '21, Peyton G. Cooper '34, C. Frank Skinner '23, George R. Prout '22, Ballard Burgher '09, Stuart John '26, N. B. Gregory '09, E. G. Senter, Jr., '17, Herbert H. Sutton '09, R. F. Munoz '09, and Samuel W. Marshall, Jr., '28. — E. G. SENTER, JR., '17, *Secretary*, 210 Construction Building, Dallas, Texas.

M.I.T. Association of Buffalo

On November 16 the Buffalo Alumni gathered at the University Club for the annual election meeting. When the ballots were counted the tellers reported that the following were elected: President, H. G. Brockington '25; Vice-president, J. M. Gaines, Jr., '26; Secretary-Treasurer, C. J. Bernhardt '28. It was voted that these officers will serve until June, 1938, so that future elections will be in line with the rest of the local Alumni Association Club elections. After dinner we had the pleasure of hearing Paul Hansen '02 tell us of his work in connection with the Buffalo Sewer Authority. Mr. Hansen told of the many technical problems that had been encountered in the work and of their solution. He illustrated his talk with many maps and drawings made for the Sewer Authority and was obliged to answer many varied questions about the details of the work.

Those attending were: G. E. Barker '30, C. J. Bernhardt '28, J. B. Brinkerhoff '22, H. G. Brockington '25, J. G. Brunner '34, B. C. Buerk '30, W. O. Christy '31, T. J. Coleman '34, F. F. Donoghue '32, R. Ewing '35, W. Ferguson '22, J. M. Gaines, Jr., '26, M. Gorham '93, A. D. Higgins '20, H. F. Hubbard '36, E. O. F. Jones '27, C. H. Mohr '33, Burrows Morey '06, E. M. Pierce '33, G. P. Standley '27, and N. Stone '15.

With Mr. Greenwood of Buffalo Technical High School, Mr. Himmele of Lafayette High School, Mr. Gilland of Nichols Country Day School, and Professor Riegel of the University of Buffalo as guests of the Association, the Buffalo Alumni gathered at the University Club on December 4 to honor B. Alden Thresher '20, the new Director of Admissions at the Institute. Professor Thresher outlined the methods of admission to the Institute and told of the new work that is

planned for the future. The discussion that followed was most interesting, as the invited guests had many detailed questions to ask. Those attending were: R. D. Bates '14, M. C. Brock '17, H. G. Brockington '25, W. O. Christy '31, T. J. Coleman '34, F. F. Donoghue '32, J. Duff, 3d, '35, R. Ewing '35, W. Ferguson '22, L. H. Flett '18, K. M. Gold '29, M. Gorham '93, M. N. Hayes '36, H. F. Hubbard '36, C. H. Mohr '33, A. M. Patterson '33, C. W. Smith '35, J. P. Sullivan '24, and H. S. Toole '17. — CARL J. BERNHARDT '28, *Secretary*, New York State Department of Health, 65 Court Street, Buffalo, N. Y.

M.I.T. Club of Northern New Jersey

There has been a change in the Club's schedule of smokers, and the meeting announced for January in the last issue of The Review will be held on Thursday evening, February 4 at the Newark Athletic Club. Two excellent speakers will present short talks on subjects of popular interest and there will be the usual opportunity for a general get-together after the smoker. Mail announcements have been sent to all the Alumni in the Club's district; if yours has not arrived please notify the Secretary.

Wednesday evening, April 7, has been set as the date of the annual banquet to be held at the Newark Athletic Club. Watch for a further announcement of the Institute's splendid coöperation in helping celebrate our second anniversary!

All Technology people are cordially invited to these meetings and to the monthly luncheons held at noon on the second Thursday of each month (until May) at the Newark Athletic Club. — CAROLE A. CLARKE '21, *Secretary*, 10 University Avenue, Chatham, N. J. Freeman B. Hudson, Jr., '34, *Assistant Secretary*, Colgate-Palmolive Peet Company, 105 Hudson Street, Jersey City, N. J.

Technology Club of New York

The Club opened its fall season with a meeting labeled "Political Night" at the Club quarters, 22 East 38th Street, on October 22. This was before election day, when political speculation was running high and straw polls were predicting results to suit everyone's opinion. Naturally a large gathering turned out. The speakers were: Frank W. H. Adams, former United States district attorney, who presented the Democratic point of view; and the Honorable Franklin W. Fort, former congressman from New Jersey, who represented the Republican National Committee. After the talks, refreshment in the form of foaming steins of beer was served to everyone, to top a pleasant evening.

"The Real Soviet Russia" was discussed at the meeting on November 17 at which more than 200 members were present. The speakers were Nicholas Michailoff and Frank M. deGroff, who have recently returned from Russia. Mr. Michailoff was a noted lawyer in Russia, where he practiced until he came to this country in 1933. He gave a scholarly exposition of the present conditions in Russia, comparing them with conditions before the Revolution. He indicated that what progress has occurred in Russia has been entirely material and has come through the payment of an exorbitant price in personal liberty and human life.

Mr. DeGroff, a miner, related that he left the United States to go to Russia because he had faith in the Communistic system. Shortly after his arrival, however, he became dissatisfied with the conditions under which he was forced to work and sought to return to this country. After much hardship he succeeded in reaching the United States. He described the conditions of the Russian worker as intolerable, although he gave credit to Russian youths for their ability to master a trade quickly and effectively. After the meeting there was a spirited discussion from the floor in which many members took part. The meeting closed with the serving of light refreshments.

The night of February 24 will be a banner night in the life of every Technology man residing in this district. It has been announced as the date of the annual Club dinner to be held in the Waldorf Astoria.

Membership in the Club continues to mount. Here is a list of recent new members: Walter F. Noyes, Jr., '36, John J. Winn, Jr., '21, Fred J. Bechstein '35, Kenneth Bernard '22, Charles D. Hanley '35, David Dasso '12, T. M. Pomeroy, Jr., '35, Charles J. Burke '22, Louis Pflanz, Jr., '35, J. Stuart Sneddon '10, Marcel P. Aillery '31, Edmund D. Gittens '35, George M. J. Mackay '08, Francis D. Porcher '19, Charles H. Chatfield '14, William B. Wingert '23, Norman F. O'Shea '30. — CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N. Y.

Technology Club of Philadelphia

We held our first meeting of the season in the neighboring city of Wilmington, Del., on Monday, December 7, at the Hotel duPont in honor of President Compton. A record attendance was on hand, either because Philadelphians like to travel or, what is more likely, Dr. Compton is growing in popularity as he is becoming better known to the Alumni. Anyway, there were 140 members present: 100 from Philadelphia and 40 from Wilmington.

After an excellent dinner, President George E. Whitwell '15 conducted a short business meeting in which he resigned his presidency due to the press of other matters, and Reginald A. Wentworth '04, Vice-president of Sharp and Dohme, Inc., was unanimously elected our new president. A rising vote of thanks and appreci-

ation was then given Mr. Whitwell for his fine work in building the Club up from the low depression level of three years ago. A short report by the Treasurer, Granger D. Schrader '30, gave evidence of what has been accomplished by the Club under Mr. Whitwell's administration.

Continuing to hold office for the duration of this meeting, Mr. Whitwell then introduced Dr. Compton, who gave a comprehensive and very interesting and enlightening picture of what is going on at the Institute and what will be going on there in the next few years. More particularly he spoke of the dinghy fleet in the Charles River Basin, proposed new dormitories, and a new gymnasium, which made a good many of those present wish they had not been graduated so soon. On the educational side he told us of the establishment of new fellowships for teaching and for advanced study for promising young men in industry.

Dr. Compton limited his talk to 45 minutes, as a rumor had gone around that most of the Philadelphians wanted to catch a train, but when the meeting was thrown open to questions and general discussion, this train seemed to have been forgotten, and the meeting did not break up for some time after that, when Dr. Compton felt he would really have to catch his train for Boston. — ISAAC G. SWOPE '27, *Secretary*, 1000 Chestnut Street, Philadelphia, Pa.

Port Arthur Gathering

Early last June, a group of 23 Alumni met for the purpose of establishing an informal organization to promote good-fellowship and the name of M.I.T. throughout this section of the country. These men were the following: Louis Blenderman '35, J. Preston Conner '35, Alexander D. Donners '32, Alton J. Deutser '33, Enslo S. Dixon '18, Hugh Elliott '22, Henry Flynn '23, Thomas E. Garrard '28, Leon P. Gaucher '28, Robert S. Hatch '27, Willard E. Imhoff '18, John J. Loustau '32, Eugene F. Lynch '32, Theodore A. Mangelsdorf '26, Robert E. Manley '21, John D. Moriarty '30, David W. Morter '31, William S. Reitter '30, Edwin K. Reid '36, Duff Smith '33, Byron L. Sowers '31, Winthrop A. Stiles '36, Halsted R. Warrick '32.

At our first meeting at the Hotel Sabine it was unanimously decided to hold informal meetings once a month. No officers have, as yet, been elected nor have we completed our articles of constitution since our group is still in the process of crystallization. However, the spirit of our Alma Mater runs high, as has been shown by the fine attendance at several dinner meetings. At a recent dinner given by the Technology Club of Southern Texas in honor of Dean Lobdell '17, 12 of us made the 125-mile trip to Houston.

We feel that if enthusiasm is properly directed, many people in this section will learn about M.I.T. and its high standards. — WINTHROP A. STILES '36, 640 Stilwell Boulevard, Port Arthur, Texas.

M.I.T. Club of Central New York

On December 8 at the University Club of Syracuse Professor B. Alden Thresher '20, Director of Admissions at the Institute, gave an interesting talk to our Club. This was a dinner meeting and the following were present: F. S. Hungerford '24, Frederick W. Barker '12, Louis A. Waters '20, Harry N. Burhans '07, Theodore E. Simonton '24, J. Harold Kaiser '19, F. J. Sawyer '24, F. D. McKeon '26, F. P. Hall '21, C. K. Lawrence '24, W. L. Nye '25, Jim Eng '35, Edward C. Booth '25, Harold P. Gray '16, Samuel N. McCain '09, Donald W. Diefendorf '30.

In addition to these members the Club was glad to entertain some guests: Arthur Francis, a prospective student; Mr. J. P. Francis, his father; Donald E. Chappell, guest of L. A. Waters; Charles W. Bradlee, head master, Pebble Hill School; H. R. Eaton, principal, Central High School; Leon H. Coon, principal, Grant Junior High School; John F. Hummer, assistant superintendent of schools in Syracuse; L. A. Donohue, principal, Vocational High School. — DONALD W. DIEFENDORF '30, *Secretary*, Diefendorf Gear Corporation, P. O. Box 934, Syracuse, N. Y.

CLASS NOTES

1878

We regret to report the death of Blanche E. Williams, widow of our classmate, Emile F. Williams, on December 9. We quote from the Boston *Evening Transcript* of December 11: "Funeral services for Mrs. Blanche E. Wheeler Williams, author and one-time instructor of classics at the Mary C. Wheeler School, Providence, were held today in St. John's Chapel, Brattle Street, Cambridge. Interment was private."

"Mrs. Williams, who died at her home, 8 Lowell Street, Cambridge, was born in Concord in 1870, a daughter of George F. and Alice R. Wheeler. She received her early education at the Concord schools and later attended Smith College where she was graduated in 1892. Shortly after, she became associated with the Mary C. Wheeler School in Providence. In addition to her teaching, Mrs. Williams traveled extensively throughout the world. In 1901 she accompanied Mrs. Harriet Hawes on an archeological expedition to the Island of Crete. She was the author of several books among which the biography, 'Life of Mary Wheeler,' is best known."

"Her only immediate survivors are three brothers: Ralph M. Wheeler, Wilfred M. Wheeler, and Allan R. Wheeler." — ALFRED S. HIGGINS, *Secretary*, 248 Northern Avenue, Boston, Mass.

1884

In my first report to the Class it has become my sad duty to record the death of our Secretary, Augustus H. Gill, on November 11, *atatis* 72, at his home, 41 Myrtle Street, Belmont, Mass. He was

1884 Continued

born at Canton, Mass., August 1, 1864, and received his education and preparation for the Institute at the local schools. After graduation he was one of the 14 members of the Class who returned to the Institute as an assistant and was the last one of that number to remain in its service. He was for two years lecture assistant to Professor Nichols '69, one year instructor in general chemistry, and then he went to Germany for further study. After two years at the University of Leipzig, where he received his degree of Ph.D. in 1890, he returned to the Institute and was appointed instructor in gas analysis and assistant in sanitary chemistry. He organized the laboratory of gas and oil analysis and the Course in chemical engineering. In 1906 he was made associate professor and in 1909, professor of technical chemical analysis.

Professor Gill was the author of numerous articles and several books on subjects related to his special department of chemistry. He was a fellow and member of several scientific societies and while living in Canton gave much of his time and interest to the duties of clerk of the First Parish and as president of the High School Association. Gill's loyalty to M.I.T. and his activities in its service were appreciatively noted by Dean Prescott '94 and Professor Hall '95 in the December number of *The Review*. Gill served many years as our Class Secretary and we shall miss the friendly welcome and cordial greeting with which he received visiting classmates. — SAMUEL S. DEARBORN, *Assistant Secretary*, 4 Newport Road, Cambridge, Mass.

1888

Our chief staff correspondent Ben Buttolph, tells us that Charles G. Merrell was nominated, and undoubtedly was elected, county commissioner at the recent election in Cincinnati. Merrell has long been interested in the nonpartisan administration of city and county affairs and is an ardent advocate of the merit system in civic service as one means of securing economic and efficient government. We wish him success in his attempt to introduce a businesslike administration in county affairs. Merrell has been president of the William S. Merrell Chemical Company, of Cincinnati for the last 22 years. — Bertram P. Flint can now be reached care of the Bank of Montclair, Montclair, N. J.

We have just lost one of the most colorful members of the class. Edward P. Quigley, resident of Birmingham, Ala., since 1888 and prominently identified with the business interests of that city, died on December 4 following a short illness. He entered Technology with our class from Pewee Valley, a suburb of Louisville, Ky. At first he was connected with the Alabama Abstract Company and after that with the Tennessee Coal and Iron Company, until 1906 when he went into business for himself as examiner of land titles, making a specialty of abstract contracts, title correction field work, care of mineral titles, tax return valuation and conflicts, and adverse

possessions in retrogradation. Quigley was the best authority in his line in the extensive mineral fields of which Birmingham is the center. Those who knew him well at Tech remember his true Southern hospitality and lovable character. He was much interested in athletics, especially boxing, and many will remember the lively matches he took part in during our early years in the old Exeter Street gymnasium. During the last few years he had written the Secretary many times deploring his inability to meet again his old classmates at reunions and Ned Webster's dinners. He was very proud of his membership in the Class of '88. It is too bad he had to go before our Grand Fiftieth in 1938.

President Alfred H. Sawyer has sent us a clipping from the Boston *Evening Transcript* which states that Paul Winsor died in Waltham on December 10 and that he was graduated from Technology in 1888. On looking up the records we find that Winsor entered Tech in 1882 with the Class of 1886 and remained three years, entering the employ of the Boston Elevated Railway Company in 1885. Your Secretary remembers him very well as anchor of the Institute tug-of-war team during the winter of 1884 to 1885. Prexie Sawyer is undoubtedly the class champion of tennis, canoeing, and mountain climbing, and with his 225 pounds of bone and muscle is in the same class with Frank Ladd, our football guard in 1887 when Technology defeated Dartmouth, Williams, Amherst, Wesleyan, Tufts, and the rest.

Fred Ellis, city engineer of Melrose, Mass., is not responsible for the Melrose High School Building's looking like a "battle ship at sea" after the December rains, for he had nothing to do with its location. — While wandering around in the rain and fog off Cleveland Circle, Brookline, your Secretary collided with Major General Horn looking as solid and fit as when he led the expeditionary forces into Siberia in 1918. Harry was the Beau Brummel of the Class in undergraduate days and still is. — Stone and Webster paid a dividend recently.

Your Secretary has returned to "God's country" again, as Sawyer styles it. In other words he has made his annual return from Chebeague Island, Maine, to 72 Oxford Road, Newton Centre, Mass., where he will be very glad to see any of the "glorious Class of '88" at any time. — BERTRAM R. T. COLLINS, *Secretary*, 72 Oxford Road, Newton Centre, Mass.

1890

We regret to record the death of Cornelius S. Davis on January 14, 1935. — Changes of address have been received from the Alumni Office: Dr. George E. Hale, 360 Grove Street, Pasadena, Calif.; Lieutenant Colonel Anthrine W. LaRose, 100 Jay Street, Albany, N. Y.; Edward A. Northey, 50 Commonwealth Avenue, Boston, Mass.

A letter from Darragh deLancey early in November told of heart trouble which is tying him up. He writes cheerfully and philosophically as follows: "When one

elects to have a cardiac valve kick up, one adopts a new time unit of months, not days or weeks. So when I found I was up against a bit of maladjustment of the mitral valve, I knew I was up against a long siege. However, we are making steady progress, appetite is good, spirits are cheerful, and we have plenty of time to meditate on our mercies and upon how many of the good things of life we are still permitted to enjoy."

Bertram A. Lenfest, who has been for a long time head of the metal work department of the Brooklyn Technical High School, has been enjoying a sabbatical half year in the West. He is finishing it with a sea voyage to the West Indies before returning on February 1. — GEORGE A. PACKARD, *Acting Secretary*, 50 Congress Street, Boston, Mass.

1892

Harry J. Carlson, as a director of the Boston Chamber of Commerce and chairman of its fire prevention committee, has organized and carried on a school for watchmen in conjunction with the State Board of Education. Since the beginning of this important work and up to the end of its third season, 1,119 watchmen have been so trained that they are able to give better service to their employers.

Henry C. Dresser, general manager of Martel Mills Corporation, 79 Worth Street, New York City, was a recent visitor at M.I.T. Charles F. Park saw him and reports Tommy the same jovial good-fellow that all Course II men will readily recall, and Park says he had to sing for him "My Girl Lives in Baltimore" and other songs of the gay Nineties. — JOHN W. HALL, *Secretary*, 8 Hillside Street, Roxbury, Mass. W. SPENCER HUTCHINSON, *Assistant Secretary*, Room 6-201, M.I.T., Cambridge, Mass.

1894

The Secretary's appeal of October 13 must have been particularly touching, for many have kindly responded with news of themselves and therefore made it possible for this grist of notes. In fact replies have been received from a number of men who in years past have not deigned to reply to class letters. It is also very gratifying to state that a real contribution to the work of the Athletic Association has been made possible by the generosity of the men who responded to the request for a dollar. Let me take this opportunity of expressing the thanks of all concerned.

The first items must be of a character to fill us with regret, for I have to announce the deaths of Frank P. McKibben and of John H. Buttimer. McKibben was for many years a member of the staff of the Civil Engineering Department at the Institute and then became head of the department at Lehigh. After this he went into consulting practice and in recent years has made his home at Blackgap, Fayetteville, Pa. He had a very fine reputation as a consulting engineer and his services were much in demand in the days before the depression. Recently he was attached to the PWA in Washington as a

chief of section and was one of the authors of the report for the National Resources Committee. He died of cancer of the stomach on Friday, November 27. Mrs. McKibben and a son, Elliot '25, survive him. John Buttmer spent a relatively short time at the Institute as a student. The Secretary is not informed as to his occupation during some of the intervening years, but at the time of his death, which occurred on November 10, he had been supervisor of buildings and grounds at Andover Academy for many years.

Gilkey reports that, like the birds, he has migrated southward and gives his address as 24th Avenue North, Corner Woodlawne Circle, St. Petersburg, Fla. Any classmates who are visiting Florida this winter would certainly receive a welcome if they looked him up. — Mrs. Walter B. Griffin, whom we all knew as Miss Mahony, is one of our globe circlers; after living for many years in Australia where she and her husband designed the new capital, Canberra, and later living at Willoughby, New South Wales, she now reports her address as 6 Couper Road, Lucknow, India. It would be interesting to hear Mrs. Griffin describe the experiences of a woman architect of international character during the period since she left the Institute. — The elusive Hulse is lost again. He was reported as being in Schenectady and the Secretary blithely wrote him at this address, but the letter came back. Here's hoping that he will again be found and this time that he will stay found.

Bill Sayward has removed with his son from Griswoldville, Mass., to Slatersville, R. I., where the latter has an important position in one of the mills. — We all remember the fair-haired Jack Story who was quite prominent in freshman athletics. Jack has been very reticent but now comes through with the information that he is the proprietor of Story and Company, operators in real estate in Washington, D. C. His home address is 1822 19th Street. He admits to having four grandchildren, to having gone to Europe within the last year or two, and states that he tries to break 120 at golf as relaxation for the tired business man. — John Ferguson sticks to the Bay State. He is now district waterways engineer for the State Department of Public Works, spends a portion of his winters in Florida and his summer week-ends in New Hampshire. John lives at 143 Blue Hill Avenue, Milton. — John Nowell is one of our retired business men who uses his retirement in public service as city manager for the town of Hillsborough, Calif. John brags a bit about having eight grandchildren. He plays golf as a major and dominoes as a minor sport. He says his wife asks: "Why do we always vote for the losing candidates?" This leads to the interjected remark that the judgment of the Class as a whole in picking a presidential candidate seemed to be pretty much on the losing side. Last year John and his wife came East by going west, leaving California and going to Australia and Tasmania, then across Australia by

train, across the Indian Ocean to Durban, followed by a visit to Johannesburg and Southern Rhodesia. At Beira they again took ship up the East Coast of Africa and on to Marseille, visiting Nairobi on the way. The European visits included Nice, Grasse, Genoa, Paris, and London. The Nowells then motored to Liverpool and took the S.S. *Franconia* to Boston. John's sorrow at learning I was away is fully reciprocated, as it would have been great to have talked over old times with him.

Luther Nash writes from 90 Broad Street, New York City, where he is vice-president of Stone and Webster Engineering Corporation in charge of appraisals and rate and business investigations relating primarily to public utilities. Luther has been continuously connected with the Stone and Webster organization for more than 40 years and his activities have covered everything from simple engineering to political engineering. He makes his principal home in New York City but spends his summers and other vacation periods on the Massachusetts coast and in the Maine lake country. Nash is one of our prolific writers, having written two rather comprehensive books, one dealing with the "Economics of Public Utilities," and the other, "Public Utility Rate Structures." Both of these are standard texts in schools of engineering and business administration. In addition to his books he has written many technical articles, some of which have been translated into foreign languages. An analysis of the Public Utility Holding Company Act, which he made under the title "Why Killing the Holding Company Will Harm the Public," was reprinted and widely distributed.

Charles Dickey has for a number of years made a permanent home in Honolulu and is actively engaged in the practice of architecture with his offices in the Damon Building in that city. In addition to architecture, he is interested in yachting, horseback riding, and golf. — John Nisbet is another of the men rarely heard from. It is pleasant to report, however, that he replied to the October 13 blast that he lives at 1327 Peachtree Street, Northeast, Atlanta, Ga., that he is chairman of the trustees of the Jesse Parker Williams Hospital in Atlanta, and has traveled throughout South America, Central America, and Mexico within the last two years. John fishes, shoots, and hunts as means of diversion. — Joe Kimball is the principal hydraulic engineer for the TVA and is located at Knoxville, Tenn. His home address is 3000 Linden Avenue, Knoxville. If you want to see what the TVA is doing, I am sure that Joe can put you wise.

The Secretary wishes all a Happy New Year, although the year will have begun ere these words are put into cold type. — SAMUEL C. PRESCOTT, Secretary, Room 10-405, M.I.T., Cambridge, Mass.

1895

This issue is not a holiday edition yet the news herein must be with the editors on December 24, the dead line. Your Secretary has a conscience, unfortunately,

THE TECHNOLOGY REVIEW

and bemoans the fact that little news of the Class is at hand. We desire, however, to express appreciation to those who have contributed toward lightening the burdens of your Secretaries and to urge the more modest members of the Class to report their personal, as well as their professional, doings. It is human to expect that some one will be interested in knowing what the other fellow is doing.

Fred W. Draper is now making his headquarters at the Red Banks mine, Bagby, Mariposa County, Calif. We noted in the Boston *Evening Transcript* of December 15 the announcement of the engagement of Miss Sarah Porter Hunsaker, daughter of Professor Jerome C. Hunsaker '12 and Mrs. Hunsaker of Louisburg Square, Boston, to David Swope, son of Mr. and Mrs. Gerard Swope of Park Avenue, New York City, and Ossining, N. Y. They are to be married this month.

The best of health, happiness, and prosperity throughout 1937 to all the members of the Class are the sincere wishes of the officers of your Class. — LUTHER K. YODER, Secretary, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, Assistant Secretary, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

1896

An announcement received by the Secretary which will be of interest to class members was that of the marriage of William Lacy Root, Jr., to Miss Blanche Young McGeoch in Pittsfield, Mass., on November 21. He is the son of our classmate and was one of our '96 scholarship boys taking chemical engineering.

Mail having been returned recently from our classmate, John H. Pardonner, Jr., who was a special student in Course IV with us, the Secretary wrote to Charlie Paul in Dayton, Ohio, and learned that Pardonner had moved from Jefferson Street, Dayton, to 1716 Brown Street. Charlie reported that for himself there was nothing spectacular. He is still busy with consulting work, mainly on dams and river control. He doesn't have time to think of retiring, but once in a while he does stop to consider what may happen if they cease building dams and controlling rivers, or if he falls down on a job, so that he may have more time for golf and other things that also need attention.

Bakenhus has told of a dinner of '96 men held in the main dining room of the New York Athletic Club on Wednesday, December 2. Nine members were present, namely, Bakenhus, Freedman, Gaylord Hall, Lawrence, Melliush, Ruckgaber, Ed Sturtevant, Tilley, and Trout. Communications were received from Dorrance, Sager, and Starr, who would have been present except for previous engagements. This was a pretty good turnout for the '96 men who are located around New York, who include, in addition to the names already given, Crane, Crocker, Gayler, Charlie Hall, Rutherford, and Stevens. After the dinner the meeting adjourned to one of the spacious lounges.

1896 Continued

in the Clubhouse for a general talkfest and personal reminiscences. The men had been in various parts of the world: the Philippines, South America, Panama, and elsewhere. Different men told of their individual experiences with men of the world, from presidents of the United States down. The affair was arranged by Bakenhus and Tilley, and they were surprised and pleased at the turnout on such a rainy night. One man even cut his life class at the Art Club, where he is taking lessons in drawing with a beautiful example of femininity as a subject. Others came considerable distances by motor. The gang was reported to be a healthy looking lot, and all were still going strong and had accomplished much. The gathering had been planned for some time, but was pulled off on December 2 because Charlie Lawrence happened to be in town that week. After the episode of the class dinner at East Bay Lodge in June, the decision was reached that this New York dinner would be a stag affair. Lou Morse was in New York that night as president of the American Society of Refrigerating Engineers, but his official duties at the annual convention of the society being held in New York that week made it impossible for him to go to the dinner. The success of this New York gathering was such that everyone present agreed that another meeting should be held before the winter was over, and the expectation is that the Secretary may be in New York on February 16 and 17, and if he is there at that time, a meeting will be held.

After the successful gathering in New York, Admiral Bakenhus decided that the time was ripe for a little gathering in Boston and consequently he appeared at Technology on Wednesday, December 9. Incidentally, he claimed that his objectives in Boston were to visit the Navy Yard in Charlestown and also to meet Dr. Compton and do a little scouting in preparation for his job as a member of the Visiting Committee in the Department of Mathematics at M.I.T. It was unfortunate that Rockwell may have had a premonition that Bakenhus was headed toward Cambridge. Whatever may have been the cause, Rockwell was away, having gone over to New York for two or three days just at the time that Bakenhus was here. In Rockwell's absence the Secretary got busy on short notice and rounded up some of the fellows for an informal luncheon at the Parker House on Thursday, December 10, which was very successful. Those present included Fred Damon, Bob Davis, Jim Driscoll, Henry Hedge, Frank Hersey, Gene Hultman, Myron Pierce, Elmer Robinson, Bert Thompson, and L. S. Tyler. Of course Bakenhus himself was there and Secretary Locke as well, and just for full measure a guest in the person of Joe Levis '26, the noted M.I.T. exponent of fencing, which is a field in which Bakenhus himself is doing some very fine work. At this luncheon there was no formal program, but two happy hours were spent renewing acquaintance, hearing from Hultman about the work of his Metropolitan District Commission of

today, and also some of his previous interesting experiences as police commissioner, fire commissioner, and what have you; Bakenhus' ideas on Navy affairs and European conditions; Hersey's hobby of homing pigeons; Myron Pierce on international affairs, and, of course, everyone on former King Edward's matrimonial problem. Joe Driscoll, Perl Underhill, and Will Hedge were unable to be present, much to their regret.

Bakenhus seems to be becoming more and more active, if such a thing be possible. In September he talked before the Washington Society of the M.I.T. on the work of the Corps of Civil Engineers of the United States Navy. — The Secretary has received from Mrs. Maria Sears, the widow of Mort Sears, a story of the automobile trip which she and Mort took together last summer to Nova Scotia. It had been long planned and was a wonderful trip as the fulfillment of years of expectancy. Even during that trip he had a little phlebotic weakness in his leg. He had appendicitis just after graduation in 1896 and a resulting thrombus, which never completely left him. He was ill during August, but recovered sufficiently to go back to work in September. He developed a cough, but kept on working. However, it ran into pneumonia, and in spite of a wonderful fight he was unable to survive.

Norman Rutherford has been busy all summer digging and building himself a cellar at his camp on Long Island. He says that it was hard work for an old man to do without any aid whatever, but it is a great success and well worth the effort. — Mort Tuttle seems to have survived the depression very well. In his business of contracting and construction he foresaw the effect of the depression and therefore went into industrial engineering to tide him over. Now construction is picking up again, and his company is just finishing a paper mill in the South and has another paper mill at Charleston, S. C., about one-third completed.

A letter from Haskell Smith to Rockwell tells about his second boy, who incidentally was one of Rockwell's babies. This boy has been graduated from Ohio State and plans to study law. He was first choice guard on the Ohio State team. He had a most successful football career and was put on the Big Ten guard. — The second installment of report by the Fullers tells of their passage through the Panama Canal and up the Pacific Coast to Los Angeles, where they arrived on November 2.

Harold Boardman reports that even though he has retired from the presidency of the University of Maine at Orono, he and Mrs. Boardman have, nevertheless, been nearly as busy as when he was on the job in the president's office. They had a son and a daughter graduated from the University in the class of 1936. After commencement they went to their cottage on Frenchman's Bay, Maine, for the summer. The summer was rather upset because the daughter had a long siege in the hospital. However, she is now fully recovered. Boardman is apparently

getting his health back to normal after the strain of his term of presidential duties at the University. — An item reported by Gene Hultman was that Bill Huey had gone to work for the Metropolitan District Commission on the new Quabbin water supply in Massachusetts.

Dean Lobdell '17 was in Houston, Texas, in November, and at a gathering of Technology men there he ran into J. Milton Howe and had quite a chat with him over Technology affairs and '96 men. According to Dean Lobdell he still retains his youth, both in looks and in actions, and is the same peppy individual as of yore. — A classmate located right around Boston who is seen very rarely is Ralph Henry. However, he is apparently still alive, as the Secretary recently read a little article written by Henry on the beauties of the new development of Oak Hill Village in Newton.

Classmates around Boston may have read in the local press of the tragic death of Mrs. Frederick E. Field, which occurred from asphyxiation at a fire in Greenfield, Mass., on December 7. It seems that Mrs. Field's mother died in Montreal, Canada, where Fred Field has resided for many years as city filtration engineer, and the remains were brought to Greenfield by Fred and Mrs. Field. They were staying over night at a rooming house prior to the services which were to be held in Greenfield. Fire broke out during the night, and Field himself was able to escape from the room in which he was sleeping in the rear of the top floor. He attempted to reach the room in the front of the house on the second floor where his wife and Mrs. Dorrance, who had accompanied them from Montreal, were sleeping, but was driven back by the fire. When the firemen managed to reach the victims they found them stretched on the floor. Mrs. Field and Mrs. Dorrance were removed to the office of Dr. Kent who lived next door, but all efforts to revive them, which were continued for three hours, were unavailing. Although they were slightly burned about the face, death was due to asphyxiation. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1898

A dinner attended by local members of the Class was held November 12 in the Silver Room of Walker Memorial at M.I.T., and, incidentally, this is a splendid meeting place for a group of about 20. Mr. Bridges served us a very fine dinner, and the efficient student waiters completed the perfection of the service. Present were: Fred Dawes and his son, Robert '26, M. De K. Thompson, Robert Draper, Charley Pease, George Cottle, Henry Sullivan, John T. Robinson, Simon Fleisher, Henry Richmond, George Wright, Charles H. Smith, Elliott Barker, Ed Chapin, Bill Perley, Arthur Blanchard, Roy Peavey and his son-in-law, Samuel Young. Expressions of regret and of good wishes were re-

ceived from the following who were unable to be present: Charley Winslow at New Haven, Frederic M. Kendall of Framingham Center, Joe Sears at East Dennis, E. A. Bragg at Milford, A. W. Shaw of Boston, Charley Wing at New Bedford, Burton A. Adams at Springfield, Roger Babson at Wellesley Hills, Raymond Willis in New York, Shirley Philbrick at Rye Beach, N. H., Bob Kendall, Henry Scott of Framingham, Walter Kimball of Boston, and Van Lansingh, who was leaving for California.

George Cottle brought some of his motion picture films. He not only has wonderful skill in taking pictures but he tells a most interesting narrative to accompany them. He studies the customs, history, politics, industry, art, economics, and geography of all the places he visits. The high spot in these pictures was Kaieteur Falls in the South American jungles of British Guiana. The falls are something like a thousand feet sheer drop and of large volume. George must have risked his life climbing to some of the points from which he took his pictures. Ed Chapin read a several-page description by Lester Gardner of his trip across the ocean on the airship *Hindenburg*. Since then we have received another circular letter from Lester describing his experiences in Russia. It will be remembered that he is representing the Institute of the Aeronautical Sciences on a tour of Europe to study the progress of aeronautics and that he travels entirely by airship or airplane.

Ed Chapin's daughter, Elizabeth, was married on September 24 to Dr. Holden Furber of Harvard. The couple, both of whom are students of history, will spend next year in travel and historical research. — Roy Peavey has not been strong and has spent much of his time in Florida. We were glad that he could be with us at the dinner and to see that he is gaining. — Burton Adams has been in school work for 36 years. He is now principal of the Technical High School in Springfield, Mass. — Fred C. Gilbert has recently arranged a unique display of Montana gold nuggets and Montana jewels at the Denver convention of the American Mining Congress.

We were shocked at the sudden death of Walter Kimball on December 2 as we had seen him in apparently good health not more than a week before at the wedding of his niece. — ARTHUR A. BLANCHARD, *Secretary*, Room 4-154, M.I.T., Cambridge, Mass.

1900

A letter from Hal Jouett states that he is now assistant to the vice-president of the New York Central Lines in the New York Central Building, Park Avenue, New York City. — We regret to report the death of George F. Ashley, IV, who died at his home in West Townsend on October 24. It was but a year ago that he retired as professor of engineering drawing at Northeastern University.

A letter from Karl Burroughs advises of the death on October 26 of Thomas E. Penard, IV, formerly with the Edison

Company. His passing will be sincerely felt by his many friends as his outside connections were so varied. Among his interests were ornithology, natural history, and ethnology, and he was rather noted as a philatelist.

George Russell delivered an address on fluid flow in pipes at the December meeting of the New England Water Works Association held at the Hotel Statler in Boston. A newspaper report carried a picture of the professor, the youngest looking member of the Class. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

1901

Professor Locke '96, Secretary of the Alumni Association, has sent in the following further information to correct and supplement the notice regarding Tom Lunan's death, which appeared in the December Review, and we believe that Mrs. Lunan would be glad to hear from any of the fellows who were well acquainted with Lunan while at Tech or since he was graduated: "Thomas M. Lunan died on October 19, 1935. He was a graduate of Course V and for a while was private assistant to Professor Robert H. Richards '68 in the Mining Department. Afterward he became interested in the enameling process and was at various times with the Pressed Steel Sanitary Manufacturing Company in Detroit, and the Republic Metalware Company in Buffalo. In 1915 he was in business for himself as president of the Lunan Porcelain Enameling Company in Buffalo. A little later he left the enameling business and took a position with the National Aniline and Chemical Company, Inc., manufacturers of dyestuffs and chemicals, in the Buffalo plant. He stayed there about two years, until 1917, when he accepted an excellent opportunity to go to Poughkeepsie, N. Y., to start a new plant manufacturing dyestuffs. There in 1918 he was taken with an illness which lasted about a year and from which he never entirely recovered, either physically or mentally. However, about 1920 he was sufficiently recovered to take an ordinary position near Boston, and he managed under great handicaps to keep going for about four years, but from then on he very slowly failed over a long period, gradually becoming more helpless, until he passed away on October 19, 1935. Through it all he had a great courage, was very patient, never complaining, and was always hopeful of getting well again. His widow, Mrs. Adelaide C. Lunan, survives him, and also his children, two boys and two girls, all now married but one. The oldest is 32 at the time this is being written and the youngest, 26. He had a sister who was a trained nurse and is still living, having her residence in Georgia. There is also a brother who is a dentist living in Southbridge, Mass. The present address of Mrs. Lunan is 17 Washington Street, Suite 314, Malden, Mass."

Notice has been received of the retirement on June 1 of Arthur G. Hayden who for more than 16 years prior to that date

had been designing engineer for the Westchester County Park Commission, and I am including in our class records an engrossed copy of the resolution which was adopted by the commissioners in recognition of his work as an engineer and especially in regard to his designing of rigid frame bridges, which have been used not only in Westchester County [N. Y.] but throughout the United States, resulting in considerable savings to taxpayers. We can, therefore, understand how Hayden might have been so busy at the time of our reunion last June that he could not be present, but we will hope to be more favored at the time of our next meeting or reunion.

According to a December issue of the Boston *Evening Transcript* William T. Aldrich, who is well known as an architect at 30 Newbury Street, Boston, was, on one afternoon early in December, present at an important social gathering at the Hotel Somerset in Boston as president of the newly formed Wine and Food Society. The occasion of this meeting was to do some official wine tasting, and from the notice in the *Transcript* we judge that the occasion must have been a great success; the list of those expected to be present was most impressive and the list of wines to be tasted sounded most delectable; in fact, the *Transcript* referred to the occasion as somewhat in the order of an art exhibition with the palates as well as the eyes called into play. At some future class gathering we will, therefore, hope to hear further details, from the president of the Wine and Food Society.

Further acknowledgment of the receipt of class data sheets is now continued as follows: Mortimer B. Foster continues to be interested in industrial finance and management with Miller, Franklin and Company, Inc., at 347 Madison Avenue, New York City. — Our former capable Secretary, Bob Williams, is as busy as ever with the Submarine Signal Corporation, 247 Atlantic Avenue, Boston, and I am glad to say that I had the pleasure of a visit with him when recently in that city. — Charles W. Danforth gives his address as P. O. Box 448, Youngstown, Ohio, and is president and manager of the C. W. Danforth Company, analytical and consulting chemists, and also interested in fluor spar in Western Kentucky. — Chester N. Chubb is at 201 North St. Mary's Street, San Antonio, Texas, and is president and director of the San Antonio Public Service Company and the South Texas Ice Company. He states that his son is now in preparatory school and he expects is heading for Technology. — W. S. Pepperell expressed himself as most regretful that he could not attend the reunion last June but hopes for better luck next time. He is now located at 1908 Madison Avenue, Greensboro, N. C., as one of the executives of the Burlington Mills which specialize in rayon and synthetic art fabrics and so on. He says he will be very glad to see any of the members of the Class if they are down his way.

J. P. Catlin is vice-president and treasurer of Wood Newspaper Machinery Corporation, 688 South Second Street,

1901 Continued

Plainfield, N. J. — Ralph H. Stearns is with Mead and Scheidenhelm, consulting engineers, 50 Church Street, New York City. — F. Ward Coburn is general manager, E. and G. Brooke Iron Company, Birdsboro, Pa. His concern turns out pig iron, and by an interesting coincidence the next man to write in was Philip L. Buxton of 13 Southgate Place, Worcester, Mass., who is the owner of a large scrap-iron business and presumably some of the pig iron from Ward Coburn's furnaces ultimately finds its way to the Buxton plant or *vice versa*.

Miss Anna Billings Gallup, who is one of the honored lady members of the Class, has especially honored us because she happens to be the only lady member who has remembered to send in a class data sheet. As a matter of fact I find from old class records that Miss Gallup has frequently sent news items to our Secretaries and I know that as curator-in-chief of the Brooklyn Children's Museum, 940 Prospect Place, Brooklyn, N. Y., she would be most delighted to have any of the members of our Class make her a visit when in Brooklyn. Miss Gallup, as I believe many classmates know, has built up the Brooklyn Children's Museum from a very humble beginning. The Museum now occupies two rehabilitated mansions, but plans for a modern building to cost upward of a million dollars have been completed, and I understand that it is certain that the project will go through and will continue to be capably administered by Miss Gallup. We have been fortunate in receiving a rather lengthy description of the new museum building, but unfortunately space will not permit the inclusion of the article with these notes; nevertheless, I may add that there was a picture of the new museum building and of Miss Gallup and I know that the Class may be most proud of what this lady has accomplished. — ROGER W. WRIGHT, *Secretary*, 700 Main Street, Hartford, Conn. WILLARD W. DOW, *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

1902

While crossing Third Avenue at 42d Street in New York City, Bobby Pope was struck by an automobile and never regained consciousness. He died at the Bellevue Hospital three days later, December 15. This sudden death removes from our ranks the man who probably was most widely known among our membership. Robert Anderson Pope was the son of the Rev. and Mrs. Louis A. Pope. He was a nephew of Colonel Albert A. Pope of Columbia Bicycle fame and a pioneer in the manufacture of automobiles. Harold L. Pope, who was a member of the Class during our first years, was his cousin. His boyhood was spent in Newburyport, Mass., where his father was for many years pastor of the Baptist Church. On entering the Institute in the fall of 1898 his friendly spirit and his boundless energy, which refused to be balked by his handicap in speech, made him at once a marked character. With his powerful frame and his ardor he was naturally an athlete and when at his best was an out-

standing performer. The victory of our class football team in 1899 over the freshmen was in the main due to him. The score of 39 to zero, a record for interclass games for many years, was due to the fact that when Pope got free with the ball under his arm he could not be stopped. Later, when he played on the varsity team, some of our opponents said that he was a harder back to stop than any that they had encountered in playing some of the biggest teams of those days. On the track team he competed in many events and was captain at the time that he had to leave the Institute.

Pope started to take Course I, but when the landscape architecture option was introduced in Course IV he transferred to that Course. In the middle of our senior year his health made it necessary for him to give up his studies. He spent that winter as a scaler in a lumber camp in Maine and the following summer spent several months hunting and fishing in Newfoundland. When his health was restored Pope resumed the study of landscape work at Harvard and was graduated in 1905 with the degree of S.B. in landscape architecture. While at Harvard he went out for football and played on the second team. The next year, when he was eligible for the varsity, an injury put him off the field early in the season.

After graduation from Harvard, Pope went at once into landscape and housing work. He took part in the planning of the Jamestown exposition and of housing developments in many places. He wrote many articles on housing and allied subjects and even delivered addresses in these fields. His interest in industrial housing led him to espouse the single tax and other advanced political movements. For many years he made his headquarters in New York but spent much time in Alaska, where he had varied interests in mining and other developments. He traveled extensively, studying housing conditions in Europe. He also visited the Arctic and at one time tried to organize an expedition for exploration in that area. In recent years he had been interested in various promotions. During the depression he took part in several studies of unemployment problems for the city of New York.

Pope was married in 1910 to Laura H. Fischer of New York, but they separated two years ago. He is survived by his aged mother, by his younger brother, Arthur U. Pope, director of the American Institute of Persian Art and Archaeology, and by a sister, Mrs. Edward A. Behr of Brooklyn.

Pope was warmly welcomed at the few class gatherings that he was able to attend. Usually he went to Alaska before June, so that we seldom saw him. His memory will live long with all who knew him. As one classmate put it, in writing us of his death: "Bobby was certainly a most lovable and enthusiastic character."

— FREDERICK H. HUNTER, *Secretary*, Box 11, West Roxbury, Mass. BURTON G. PHILBRICK, *Assistant Secretary*, 246 Stuart Street, Boston, Mass.

1904

As I write these notes on December 23 I think it proper to wish you all a very Merry Christmas and a Happy New Year. As you read these notes approximately on February 1 I sincerely hope that you had the Merry Christmas which I wished you and that New Year's Day was bright and happy and the forerunner of a prosperous and enjoyable ensuing 12 months.

The sole item which has come to my attention regarding any of our class members is a newspaper clipping from a New Bedford, Mass., paper in October which states that Dr. Kalmus arrived at Centerville on the Cape to spend a well-earned vacation. The clipping goes on to state that he has been very busy in England with the formation of the English Technicolor Company, and was resting on the Cape where he has a very beautiful summer place.

These few words will serve to let you know that the Class is still alive, at least as far as the Secretary is concerned, and I hope that the year 1937 may be productive of items of interest which may occur to some of you and that you will avail yourselves of pen and ink and let me know about them so that I may transmit them to all the class members. — HENRY W. STEVENS, *Secretary*, 12 Garrison Street, Chestnut Hill, Mass. AMASA M. HOLCOMBE, *Assistant Secretary*, 8 Rosemary Street, Chevy Chase, Md.

1905

The hardest thing to record this month is the death of George C. Thomas, II, whose passing on December 2 reminds us of an aging we dislike to think of. We knew that George had been sick, but the memory of his sturdy physique caused the news to come as a shock even to those who had seen him last spring. Fred Poole, VI, tells us that he saw George almost daily at the Phillips House, Boston, in August, just after he had had a growth removed from inside his cheek and was apparently convalescing satisfactorily. However, in talking with the family since his death, we learn that this convalescence was never satisfactory and that the decline was gradual from the date of the operation. The following clipping from his home-town paper tells us of part of his later life, which we had missed knowing on account of the demands of business which prevented his sharing the good times of our reunions: "George C. Thomas, 15 Outlook Road, Swampscott, general superintendent of the Beverly plant of the United Shoe Machinery Corporation, assistant vice-president of that corporation, died Wednesday at the Phillips House of the Massachusetts General Hospital, Boston, following a brief illness. He was 54 years of age.

"Mr. Thomas had been a resident of Swampscott many years and took an active interest in community and civic affairs. He was at one time a member of the school committee and took pride in the school building program of the town. Born in St. Johnsbury, Vt., he received

1905 Continued

his early education in the schools of that town. He was graduated from the M.I.T. with the Class of 1905. After leaving college he became associated with the Singer Manufacturing Company of Bridgeport, Conn., where he advanced rapidly. During the World War he was sent to Russia where he was superintendent of the plant of the Singer Manufacturing Company in operation there. With the outbreak of the Russian Revolution he returned to the United States and became associated with the United Shoe Machinery Corporation. In 1925 he became general superintendent of the unit, and was later made assistant vice-president. Mr. Thomas was greatly interested in the safety and welfare of the employees of the plant, and as a result of his efforts the United Shoe Machinery Corporation has won awards for several years in the National Safety Council contests. During the past year he was vice-president of the Massachusetts Safety Council.

"He leaves his wife, Mrs. Marie H. Thomas; his mother, Mrs. C. W. Thomas of Bridgeport, Conn.; a daughter, Mrs. Laura T. Darling; and a son, Carlisle Thomas." Your Secretary attended the funeral and the large attendance was an indication of the esteem in which Thomas was held in the business and social world. The class sympathy and appreciation was represented by a floral piece, arranged for by Fred Pirie.

Fred Poole has moved from Boston to 427 Audubon Avenue, Audubon, N. J. Pressed for a story of his life, he writes a very brief autobiography as follows: "Your letter of December 15, with all the news, is much appreciated. Your memory must be crystal clear, compared with mine; I don't see how in the world you remember the old Concord Square gang. Earle Ovington and Selskar Gunn were also in it, besides George Thomas, Lutie Gilmore, and so on.

"Let me explain 'Camp Putter' to you. It is a six-room bungalow, serving as a combined playground and business (?) address. Mrs. Poole and her mother and the old hound and I are putting in a pretty comfortable winter here so far. It seems quite a bit like the middle of Florida, where we spent last winter. I have intermittent business connections with a couple of consulting companies, one in New York and one in Philadelphia, and hope this location will turn out to be sufficiently central so I can get here week-ends, at least, if contracts are within 200 miles or so. If farther away, we'll just turn the key in the lock and come back when the job is finished. That's my story and I'll stick to it, (for a while anyway). . . ."

Grove Marcy and your Secretary had a very pleasant visit with Luther Gilmore one afternoon early in December. While we were terribly sorry to find him in such a pitiful physical condition, his patience and good cheer had enabled him to rise above his misfortune and to maintain a radiant and hopeful outlook on life; this in spite of an illness of four years' duration without much medical encouragement. We suggest that he would be

mighty glad to get letters from his old classmates or visits from those in the vicinity of Boston. The address is 51 Waldorf Road, Newton Upper Falls, Mass. Wesley C. Gilman, II, had called prior to our visit.

A photograph of a beautiful young lady appearing in the Boston *Herald* of December 6 carried the further information that Grafton B. Perkins, V, would likely become a father-in-law in the near future. Here's the story: "Miss Alice Frances Wood, whose engagement to Grafton Brookhouse Perkins, Jr., son of Mr. and Mrs. Grafton B. Perkins of Cambridge, has been announced by her parents, Mr. and Mrs. William Wood of Cambridge, attended Miss Johnson's School in Cambridge and was graduated from Radcliffe in 1936. Mr. Perkins attended the Browne and Nichols School and was graduated from the United States Naval Academy at Annapolis in 1934. He later did graduate work at the M.I.T."

While we're on Cambridge subjects we noticed a reprint from *Industrial and Engineering Chemistry*, October, 1936, on "Deproteinized Rubber" by C. R. Boggs, V, and J. T. Blake '24. Those of you who understood what Charlie was talking about down at Old Lyme last June when he dissertated on latex, enzymes, and so on, will understand what it's all about; a mere Course II man just can't. We presume a reprint can be obtained by writing Charlie at the Simplex Wire and Cable Company, Cambridge, Mass. — Andrew Fisher, X, with his usual and becoming modesty informs us that the Boston Wellesley College Club has awarded its regional scholarship for the year 1937-1938 to his daughter, Edith, now a senior at the May School, Boston. Edith heads the student government body at the school.

Joe Brown, II, stands up for a seventh-inning stretch with this brief but very welcome autobiography: "As for myself. . . . I have changed my business from Sullivan Machinery Company, to the Worthington Pump and Machinery Corporation. My family, consisting of my wife, my daughter Dorothy, and myself, are all well, I am glad to say. Dorothy is completing her senior year at Bradford in Massachusetts. I am still in the engineering sales game — doing about the same sort of work as when with Sullivan. With the Worthington Corporation I have specialized on their mining and construction products and have charge of the Middle West section from Canada to Texas and from Detroit to Colorado, including some seven district offices.

"Your question regarding wealth amuses me, since I have never had the good fortune to know any M.I.T. men who amassed any considerable amount. However, so far I have been able to keep the wolf from the door and the sheriff hasn't bothered me. Please give my regards to any of the boys you see and tell them that the Midwestern climate is just as good for preserving old age as the Atlantic seaboard and that it is only very occasionally that I will even admit that I, too, am growing old."

Funny why Joe's reference to wealth should bring us pronto to news about Harry Wentworth, VIII, whom your Secretary interviewed in one of his downtown suites recently. Harry tells us that his son, Nathan, having been graduated from Dartmouth, is now assistant to the European manager of the American Foreign Insurance Association in Paris. Another son has been employed in Paris for some time. The youngest boy is in Dartmouth and Harry admits that when the last one graduates he will have a chance to become acquainted with M.I.T. again. Harry, by the way, is vice-president of the Newton National Bank, vice-president of the Brae Burn Country Club, and president of the New England Golf Association.

Ros Davis, XIII, sent us a Wesleyan University program, "A Parley on Marriage," with a blue arrow calling attention to the fact that Mrs. Katherine H. Hepburn, one of our coeds, spoke on the subject "The Cause for Birth Control." Ros says that she is a credit to the Class. The bibliography states that although Mrs. Hepburn is inevitably designated as the mother of Katharine Hepburn, famous movie star, she has many other claims to fame, both as a community leader and one of the earliest and staunchest legislative supporters of Margaret Sanger and the birth control cause. She has been chairman of the National Committee on Federal Legislation for Birth Control since its formation and has lectured widely.

We hope that the New Year 1937 will bring all 1905 men a big supply of health and happiness and as much wealth as each can stand and maintain the other attributes. — FRED W. GOLDTHWAIT, *Secretary*, 175 High Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 209 Washington Street, Boston, Mass.

1906

Attention of the readers is called to the following letter from Harold Coes dated, New York, December 10: "I wish in the next class notes you would correct an impression I am sure you didn't mean might be inferred from the class notes in the December issue. While the notes read as if I made the presentation of the golf set as a personal gift, as a matter of fact I was simply, as you know, one of many who contributed to the gift and was requested by them to make the presentation to you. I know you wouldn't want, and I certainly would not want, the impression to be gained that this was something that I was solely responsible for as a personal matter. We selected this token of our admiration, respect, and affection for you and I was simply the instrument of presentation. Don't think I am going technical on you, but I am sure when you look over the notes you will probably see it the same as I do. I plead guilty, of course, to interrupting the proceedings and that is in accordance with the record." On receipt of the above, your Secretary turned immediately to the December Review and read his previous literary

1906 Continued

efforts and here and now before the entire Class enters the plea of guilty. The notes should have read: "The orderly course of the meeting was interrupted by Harold Coes, who took the opportunity to present the Secretary with a golf bag and a complete set of clubs on behalf of the Class." The fact to be stated was so well understood by the writer that he neglected to put it in black and white for the benefit of his readers; our thanks to Harold for calling attention to the oversight.

Announcement has been received recently that O. B. Blackwell has been elected vice-president of the Bell Telephone Laboratories. Reproduced below is additional information in this connection forwarded by the Alumni Office. "Receiving his S.B. degree from the M.I.T. in 1906, Mr. Blackwell immediately entered the engineering department of the American company. In 1914 he became transmission and protection engineer of that company. With the formation of the department of development and research in 1919, he became transmission development engineer. When that department was consolidated with Bell Telephone Laboratories in March, 1934, Mr. Blackwell was appointed director of transmission development. In June, 1935, he was made manager of staff departments. While this broadened his responsibilities to cover nontechnical work, he continued his technical interests in the transmission development department and the protection development department. As vice-president he will have charge of the apparatus development, the systems development, and the protection development departments. His individual contributions to the communication art have been devoted to the practical theory of transmission and cross talk and to many problems which have arisen in transmission development, such as methods of reducing cross talk in duplex cables, improvements in telephone repeater balance, and methods of transmission testing in the operating plant.

"Mr. Blackwell is a vice-president of the American Institute of Electrical Engineers representing the New York City district, a member of the plant coordination committee and the joint subcommittee on development and research of the Edison Electric Institute and Bell System, and a member of the standards council of the American Standards Association."

To date (December 23) about 60 replies have been received for "Thirty Years After." The Secretary appreciates very much the efforts of those who have contributed their stories and assures them that if the book is not published, as originally planned, their contribution will be used in some way. Will those who have not replied make one more effort to send in their write-ups so that we may proceed with the original plan, if possible. In this connection, only today the Secretary is in receipt of a very interesting letter from George Burpee, which accompanied his 30-year story. The Secretary quotes a few extracts from the letter: "A couple of months or so ago I prepared this statement for 'Thirty Years After.' It

appeared too much like a page from some autobiographical directory to meet the purposes of the book which you were discussing, so I put it in my brief case and have carted it over half the country hoping to find a few minutes during which I could redraft it. The time to do this has not materialized, so I am sending it along as is. While I could easily write a book on some of my experiences in the past 30 years, I am afraid that it would be dull reading except to my own youngsters. If this does not fill the bill and if you would much prefer a more informal narrative, I should be glad to put it in that form. As a matter that may interest you, through the whole period of my association with Westinghouse, Church, Kerr and Company, I was working under the direction of James C. Boyd ['93], an M.I.T. student of the early Nineties. My partners in the present firm include a graduate of Geneva College, a graduate of McGill, a graduate of the University of Wisconsin, and a graduate of Harvard, so you may say that we are a cosmopolitan bunch. We have associated with us A. P. Farnsworth '17, G. Harold Warfield '15, and J. Fred Borrowdale '35." Burpee is a member of the firm of Coverdale and Colpitts, consulting engineers, 120 Wall Street, New York, N. Y.

Harold B. Harvey has recently been elected president of the Brass Forgings Association, composed of the leading firms in the brass forgings industry. The new association is working on the theory that the late NRA accomplished many worth-while things for business and industry and that the efficiency which NRA afforded can be carried on by private trade groups. The following information about Harvey is due to the alertness of Fred Goldthwait, Secretary of 1905, who noticed the item in a Wakefield paper: "Born, Parkman, Maine, June 20, 1884; son of Daniel Genthner and Ida Gertrude (Brown) Harvey; graduated, high school, Wakefield, Mass., 1902; M.I.T., 1905; lecture courses, Northwestern University School of Commerce; married Alwilda Fritsch of Chicago, May 20, 1911. Electrical engineer with Becker Brothers, Chicago, 1906; factory manager, Henry Newgard and Company, electrical construction and manufacturing, 1910 to 1915; founder, 1915, and president until 1920, Marquette Electric Switchboard Company; president, Harvey Electric Company (now Chicago Forging and Manufacturing Company), brass forgings, 1919 to 1921; founder, 1923, and since president of The Harvey Metal Corporation, aluminum, brass, and copper forgings for automotive, railroad, and general industries. Pioneer in aluminum and brass forging industry; originator of drop forgings of brass and various processes in the forging of nonferrous metals. President, 1919 to 1920, Rotary Club of Chicago, which originated and sponsored first Boys' Week in Chicago, also originated scholarship for city boys in agricultural course, University of Illinois."

This from Abe Sherman under the date of December 1 (it is to be remembered that Abe's daughter, Gretchen, is the

class baby): "For a year now the class baby has been in Syracuse, N. Y., in her advertising art work, and among the young people that she has been thrown with there was one Chan Taylor, as he was known. Late in the fall he married a girl in the same crowd, and when his parents came there Gretchen met them and then discovered that his father was Allyn Taylor of our Class. Young Taylor and his bride recently left Syracuse for a business connection in Hartford, and the following quotation is taken from the social notes in one of the Syracuse papers: 'Mr. and Mrs. A. Chandler Taylor, Jr., will be guests of honor tomorrow night at a farewell dinner to be given by Miss Hazel Petrie and Miss Gretchen Sherman. Mr. and Mrs. Taylor will leave Syracuse for Hartford, Conn., where they will reside.' The world is a rather small place after all when the second generations run into each other like this. I was in Syracuse in the fall, met young Taylor, and I think I could see a considerable resemblance to his father, as I remember him about the same age." Abe is also responsible for the news via Cy Young that Herb Whiting has suffered a shock and is critically ill.

Classmates will be sorry to learn that funeral services were held two days before Christmas in Lynn, Mass., for Charles W. Mowry, II, who collapsed Saturday afternoon, December 19, at the North Station while on a train which was about to start for his home. He died a few minutes later, from a heart ailment. He was born in Fall River, Mass., 56 years ago, was graduated from the Durfee High School in that city in 1898, and for several years worked for a local architect. He entered M.I.T. in 1902 and received his degree in mechanical engineering in 1906. Upon graduation he went to work for the Associated Factory Mutual Fire Insurance Companies of Boston. By the qualities of industry and ability which he demonstrated at the Institute he became manager of their inspection and engineering departments, the position which he occupied at the time of his death. His work led him to be recognized as an outstanding authority on fire prevention matters. He is survived by a widow, Mrs. Helen Watts Mowry; a daughter, Mrs. Edward T. Hollis of Palo Alto, Calif.; and a sister, Mrs. J. F. Watts of Plymouth. Mowry was prevented from attending our 30-year reunion as he was on a trip to the Pacific Coast. The classmate who has probably been the closest to him during recent years is Sherman Chase as he and Chase have been in committee work in connection with the American Water Works Association.

We take this opportunity to wish you all a Happy New Year. —JAMES W. KIDDER, Secretary, Room 802, 50 Oliver Street, Boston, Mass. EDWARD B. ROWE, Assistant Secretary, 11 Cushing Road, Wellesley Hills, Mass.

1907

In the place of honorable importance in these notes we will put reminder of our 30th reunion at Oyster Harbors Club,

1907 Continued

Osterville, Mass., on June 5, 6, 7. All signs point to a fine attendance. Included in the list of those who have indicated their definite intention of being present are: Phil Walker, Hud Hastings, Dick Woodbridge, Harry Moody, Fred Dempwolf, Armen Tashjian, Bob Keyes, Stud Leavell, Sam Marx, John Frank. With this great bunch for a nucleus, let us make the body grow until the resulting production exceeds anything we have known at any previous reunion. It all depends on you and *you* and *you*.

Kenneth Chipman writes from the Bureau of Economic Geology, Ottawa, Canada: "Thirty years and I haven't been at a reunion! I am not sure that I can get to this one, but I can try." Here's hoping, Kenneth. Every one of us will be delighted to see you. — Leverett Cutten of 2815 Washington Street, Allentown, Pa., tells us that his son is in the sophomore class at Tech. — Parker Dodge of Washington, D. C., writes: "Marcellus Rambo dropped into this office last spring. I was just leaving town and could not see so much of him as I wished (we used to 'strike' for one another in forge shop), but he seemed cheerful. Said the financial situation in Brazil had hit him hard; but that condition is world-wide and no great distinction. Our eldest boy is a freshman at Johns Hopkins and the youngest girl is starting kindergarten — some spread! You can see I still have a job ahead of me."

Clarence Lamont's address is now 605 Associated Realty Building, Los Angeles, Calif. — Through Professor Locke's courtesy we learn that Mr. and Mrs. L. C. Hampton have announced the arrival of Lawrence Charles Hampton, II, who was born, November 28, at Los Angeles, home 2331 6th Avenue. Congratulations, L. C.! It's a long time since we have had the opportunity of announcing any births in the families of '07 men. — Hud Hastings spent July, August, and most of September in Chicago working for the Republican National Committee as a member of the research and editorial division. He was assigned an office on the same corridor with John Hamilton and the latter's principal assistants and so was right in the thick of it. While in Chicago Hud spent one Sunday afternoon at John Frank's home, with Stud Leavell and Sam Marx also present. What exchange of ideas and good fellowship must have taken place at *that* reunion!

Here's a fine letter from Bob Keyes on the letterhead of the Surface Combustion Corporation, Toledo, Ohio, under date of November 27: "In spite of appearances to the contrary, I was very glad to receive your letter of September 4 and very appreciative of your interest in my activities and general welfare. Briefly, I have recognized since 1918, my first year in air conditioning, the crying need of a method of treating air by which the latent heat could be converted into sensible heat without change of total heat or, less technically speaking, a method which would give dehumidification without cooling. The Surface Combustion Corporation has, during the last two years, de-

veloped such a method. It is known as the Kathabar system. It employs salt or other chemical solutions which have the property of low vapor pressure and, consequently, the capacity to absorb moisture from air down to quite low relative humidities. The method is well protected by patents. When the opportunity came to me to affiliate with the Surface Combustion Corporation as chief engineer of its air conditioning division, you can readily imagine that there was little hesitation on my part in accepting it.

"Such hesitation as I did experience was due to the sincere regret of leaving the Sturtevant Company and its subsidiary, the Cooling and Air Conditioning Corporation, with whom I had been connected nearly all my life and among the organizations of whom I could count most of my best friends. Happily, the move has not had any effect on those friendships. I came out here the first of March and Mrs. Keyes followed me with the car and the household effects the first of May. We have found Toledo very much to our liking and that goes especially for the people we have met and friends we have made since coming here. Right now, we are suffering acutely from living in a most unsatisfactory house, which I had the temerity to lease prior to my wife's coming out here, and also from the pangs of house building. If you have ever built a house, you know what that is. We hope, however, to move into our new house the first of the year and that once we are settled there everything will be lovely. I have not had the good luck to run into any of the men of 1907 lately, but I am looking forward to our 30th reunion, which I suppose will be at the usual place at the usual time."

Howard J. C. MacDonald is at Jefferson Apartments, 4 East 32d Street, Baltimore, Md. — Milton MacGregor was transferred last fall from Mechanic Arts High School in Boston to the new Roslindale High School, also in Boston. He is temporarily in charge of the mathematics department in this new high school which has just opened. His daughter, Elizabeth, entered Bates College last fall and his son, Arthur, started in the Harvard Graduate School of Forestry studying game management. He received his master of forestry degree at Yale last June. — Harry Moody writes that he will certainly be at the 30th reunion "with bells on." He now divides his time between New York and Cleveland and tells us to make his address 246 Center Avenue, New Rochelle, N. Y. — James G. Moore is now at 325 Lenox Avenue, Daytona Beach, Fla. — A. H. Tashjian, architect, 2341 Carnegie Avenue, Cleveland, Ohio, is glad we are to have our reunion on Cape Cod as he has a summer home there now.

Johnnie Thomas, district superintendent of the Pacific district of American Can Company, 111 Sutter Street, San Francisco, wrote on October 27: "It seems hard to realize we are having our 30th class reunion and I wish I were nearer to Boston so that I could attend. I also hope that some urgent business

brings me East during this period, but, at present, that prospect seems very slim. We have an active Technology Club here in San Francisco, meeting every week for luncheon at the Engineers' Club. Last week Dean Lobdell '17 was with us and gave a very interesting talk on the activities of the Institute. Whenever a prominent officer or member of the Faculty visits the Coast, we try to get the 'low-down' on what you boys in the East are doing. So far, the reports have been very good. I hope you have a very successful reunion and that you will give my best wishes to all the old crowd."

Through the courtesy of Albert Wiggin, manager of reduction departments of Anaconda Copper Mining Company, Great Falls, Mont., we have received a most attractive and effective calendar and also a 60-page brochure describing the various departments of the plant. We always appreciate hearing from our classmates in these various ways. Once again, it all depends on you and *you* and *you*. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

The 1909 men in New York City met for their regular fall luncheon at the Technology Club on December 5, with Edward L. Moreland '07, now the Head of Course VI, as the guest speaker. About 20 members of the Class were present and a most interesting afternoon was spent listening to Ed's excellent report of the state of affairs in Cambridge. At all of these semiannual luncheons we have someone from the Institute, and each man brings a little different viewpoint. The part of Professor Moreland's remarks which impressed the men particularly was that attention is given to the boys who make good records in their studies, with the saving reservation that these boys have to be very different from the "greasy grind" type. It seems that a good student who also shows evidences of leadership gets every consideration from the Faculty.

A telegram was received from Tom Desmond regretting that legislative work kept him from attending the meeting. It is evident that Tom is held in very high regard by the people of New York state. — From New York also comes the news of the marriage of Mr. and Mrs. Harry Trevithick's daughter, Daisy Young, to Theodore C. Messler on November 25 at Rockville Center, N. Y. — I had a nice long letter from Ray Temple, who is now associated with the Ruggles-Klingemann Manufacturing Company, Salem, Mass., manufacturers of steam specialties. — Malon Whipple is technical supervisor for a Federal vegetable-canning project. His son, Richard, is in his second year at Northeastern University. — Doris Gilbert was one of the players in a dramatic program given recently at Jordan Hall, Boston, by the department of drama of the New England Conservatory of Music.

1909 Continued

Lee S. Border, captain in the United States Navy, is with the board of inspection and survey, Pacific Coast section, Long Beach, Calif. — Mayo D. Hersey is now with the Kingsbury Machine Works, Inc., Philadelphia, Pa. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

News of classmates seems to be getting scarce around Boston and your Secretary requests that classmates throughout the country send to him such notes of others as may come their way. Regardless of the scarcity of news, we have found that Dean Peabody has just had a book published by John Wiley and Sons, Inc., on reinforced concrete structures. We find that this book is most helpful to those who are in the business that your Secretary happens to be following.

Richard Bicknell called upon Dud Clapp at his plant in Cambridge a little while ago. Dud says that Dick appears to be in good health and fairly prosperous. He is still in the radio porcelain manufacturing business. Dick should have postponed his visit until Dud became settled in his new plant at 120 Potter Street, Cambridge. — As noted in the Boston *Sunday Herald* of December 20, Skeet Everett, who is now with the Hood Rubber Company in Watertown, Mass., has purchased a new house in Belmont. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

1911

'Twas the day before Christmas, the class notes were due, so the day before that we are typing a few. When these notes appear during the last week in January it is your Secretary's earnest hope that a banner year is well under way for each and every classmate.

We pause for a moment in tribute to one of our number who passed on, December 1 — William Row McCune, II. Entering the Institute from New York City he was quite active with us for a couple of years, his fraternity being Delta Upsilon. Illness then held him back for a time and he returned again to Technology during our senior year, at that time taking most of his subjects with 1912. We seldom heard from him, but for a number of years he was in Vancouver, B. C., with the Otis-Fenson Elevator Company. His health again failing, he returned to the States about a year ago and settled down at Greens Farms, Conn., where he died.

Two engagements of 1911 children were announced around Thanksgiving time. From the Brookline *Citizen* of November 25 we learn that: "Mr. and Mrs. George Alvin Cowee of Sewall Street, have announced the engagement of their daughter, Elenita, to Howell Drescher Chickering, son of Mr. and Mrs. Horace G. Chickering of Wilmington, Del. Miss Cowee, who is a graduate of Abbot Academy and Smith College, attended the Katharine Gibbs School. Mr. Chickering attended the Tower Hill School and

Dartmouth College, from which he received his degree in 1934. He is associated with the DuPont Company. . . ."

The Worcester *Telegram* on December 7 said: "Mr. and Mrs. Roy Gay MacPherson of Framingham have announced the engagement of their daughter, Mary Elizabeth, to John Augustus Crane, son of Mr. and Mrs. William A. Crane of Framingham. Miss MacPherson was graduated from Dana Hall in 1933 and attended Wellesley College. Her fiancé was graduated last June from Worcester Polytechnic Institute and is a member of Theta Upsilon Omega Fraternity."

On December 9 we had a dinner for members of the Worcester County Alumni Association of M.I.T. here at the Bancroft and your Secretary was delighted to have three classmates among the 53 attending: Stan Hartshorn of Gardner, and Fred Daniels and Hal Robinson of Worcester. A week later it was gratifying to read that Johnnie Bigelow, IV, had been re-elected a director of the Marlboro Chamber of Commerce.

In a recent issue of *The Tech* the students listed some 30-odd Faculty nicknames; among them were our classmate, Farmer Wilkes, II, and a 1910 man many of us remember with pleasure, Pool Shark Fernstrom. Here are some of those who were on the staff back in our days: Double F. Berry '95, Tut Tut Haven '94, Mushroom Hayward '96, Shorty Holmes '04, and Chloroform Taft '01 of Course II; Triple E. Hudson '07 of Course VI; and Molly Pearson of the English Department.

Three new addresses have been reported by the Alumni Office: James O. Greenan, III, has a new office address in Manila, Philippine Islands, the office of Marsman and Company, Inc., having been moved to the Insular Building; down in Palestine, Texas, we find a change, with Aaron L. Myers, XI, now reached care of The Grand Leader; Karl B. Kilborn, II, has left Akron, Ohio, where for years he has been with Seiberling Rubber Company, and his address is now The Close, Biddestone, Wiltshire, England.

As always it was a distinct pleasure this Christmas to have so many cards from classmates and as the years go on I sincerely hope that classmates will more and more "write to Dennie," for "as ye write so shall ye read." It takes material to make class notes and we want 1911 to continue to be noted for its regular and newsy notes. So be it! — ORVILLE B. DENISON, *Secretary*, Hotel Bancroft, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1913

So far all the material that I have been able to accumulate for class notes has come from hearsay and personal encounter. I had hoped that my efforts to make this column worth reading might have been rewarded with an occasional letter from one of our classmates. It looks now as though I should have to resort to blackmail. At any rate, the newspapers of the country recently carried the story of the appointment of Charles Edison to

the office of assistant secretary of the Navy. I am not surprised at Edison's activities in affairs of state. We were in the same class in economics, and I recall very clearly that Edison, in that subject at least, was an exceptional student. His thoughts were quite startling but always plausible.

I had a nice letter from Larry Hart in which he stated that due to the demands of business he had been forced to neglect all social contacts for the past six months. Knowing Larry to be a prodigious worker I can assure you that this might well be the case.

While leaving a Providence hotel dining room the other night I was accosted by Al Katz, who is vice-president of Colloids, Inc., of Newark, N. J. It was a very pleasant surprise and I was flattered that Al remembered me. He is one of our few bachelors and seems to be quite wrapped up in his work. We didn't have time in which Al could explain to me what colloids were. My education in science stopped pretty abruptly at the stage when the ionic theory of electrolytic dissociation had recently appeared. Perhaps Dr. Kenney would donate the column a letter on the subject in his graceful, lucid style; perhaps he might compose a clarinet solo on the subject.

In the list of address changes which I regularly receive from the Alumni Office I note that Bill deYoung Kay resides at 911 Park Avenue, New York City. I had a very pleasant meeting with Bill and his charming wife on a Southern train a few years ago. At that time Bill was with a New York financial house and he had a seat on the stock exchange; I presume he still has it. I note that old Walt Bylund is now residing at Woodmont, Conn., and I would like very much to get a letter from this rascal. — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R. I.

1914

The Dean Fales Night of the New England section of the Society of Automotive Engineers was held on December 8. Dean talked on "Speed, Style, and Safety" and covered the Vanderbilt Cup Race, as well as a summary of the 1937 models. — After being located in Bridgeport, Conn., so long that it is hard to imagine him anywhere else, Peb Stone has pulled up stakes and gone over to the Empire State Building in New York City, where he is special Eastern representative of Edgar T. Ward's Sons Company. Peb is living during the week at Tudor City but still returns to Bridgeport for the week-ends. — Johnnie Leathers, who temporarily moved to Boston during the recent presidential campaign, has decided to stay awhile, and is now associated with Arthur Perry and Company, Inc., in the investment business. Affluent classmates, please note.

For many years F. C. Atwood has been developing new processes on which several patents have been granted. This work has been carried on through an organization known as the Atlantic Research Associates of New Hampshire. This organization, together with the new processes

1914 Continued

and patents, has been acquired by the National Dairy Products, and a new corporation known as the Atlantic Research Associates of Delaware has been organized, with Atwood as president. At present he is dividing his time between 120 Broadway, New York City, and the Craft Phoenix Cheese Company in Chicago. Later he expects to have more time to attend to his laboratories which are still being maintained in Cambridge.

Your Secretary would like to take this occasion to thank the men who sent him Christmas greetings. At the same time he would remind all within traveling distance that it is but four months to Alumni Day. Also, how about a card or letter telling of yourself or of some classmate? Only by this help can these notes be made alive and interesting. — H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N. Y.

1916

Your Secretary regrets that classmates are not taking more seriously his suggestion that they keep him posted regarding news items for *The Review*. If each and every one of you would take your part, as your Secretaries are taking theirs, not only would the job be one of greater pleasure but vastly more interesting to you as well.

Frank Ross, who has been called our lowest handicapped golfer (I hope that some of you will take this as a challenge and write to me about your abilities on the links), writes as follows: "When we left Tech there was no course in self-advertising. Whether or not there has been one installed since then, I don't know, but when you write and ask me to write you a couple of pages about my experiences since graduation, I assume that you write similar letters to other classmates; the opportunity to show their training in self-advertising is certainly wonderful. Possibly if the Institute is looking for a professor for that course, it might find good material in the types of letters you receive. I was sorry to miss the crowd at Fenwick, Conn., this year because that is almost in my own back yard and I have spent a good many vacations down there in the last few years; however, as you know, I not only had a good excuse but one that I probably never will have again. I qualified for the National Open Golf Tournament at Baltusrol, which was held at the same time as the Fenwick party. Of course, I couldn't be in two places at once, but judging from the scores I made at Baltusrol, I think it would have been . . . better if I had gone to Fenwick.

"Since being graduated I have stuck to fire insurance (except for an 18-month vacation in the Naval Aviation Corps while the War was on, and, boy, it was a vacation! If they start another fracas and I get mixed up in it, that's the branch of the service I'm going to head for). I play in a golf tournament here and there and, of course, did take time off to get married

and have two youngsters chasing around now that are supposed to call me Pop, but one of them — when I'm not looking — calls me Pickle Puss. It is so long since I have been mixed up in class affairs that I'm almost afraid to go back for a reunion because I wouldn't recognize many of the fellows. I did meet Jimmy Evans 'A.W.O.L.' at a ball game in New York this summer (of course, that was part of my work) and I occasionally see Peb Stone. Then, too, Newell Foster drops in to see us occasionally, but that's about the extent of my contact with the old crew. Give me a rain check for the next reunion and if the Finance Company hasn't taken the bus away from me by that time, I'll be on deck."

Now for some real news: I quote in its entirety a wedding invitation recently received from none other than our good friend, Ken Sully, who was not with us at reunion, doubtless because he was too busy formulating plans for his wedding in Los Angeles: "Mr. and Mrs. Alexias Exias Brais request the honour of your presence at the marriage of their daughter, Juliette Brais Jackson, to Mr. Kenneth Murchison Sully, on Saturday, the twenty-sixth of December, at eight o'clock in the evening, The Church of the Angels, Pasadena, California." Incidentally — Ken Sully will wonder where I got this information, and I shall not divulge its source — Ken met this charming young lady just a year ago, so he has been working rather fast and effectively. Mrs. Sully has been described as a very attractive, dark-eyed little person, with captivating ways. Well, Ken, your Secretary hopes to be out on the Coast in 1938 and will look in on you at that time. — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

Just before the holidays one of our agents was down in Western Missouri, Kansas, and Oklahoma. Joe Gardner, freshly back from an autumn journey overseas, with packed portmanteaus tightly stuffed by ultralight *objets d'art* for his gallery in Kansas City, consented to receive a visitor. His observations on conditions in France and Germany are as interesting as his antiques, but could not be released for publication prior to next June. He is planning to bring to the reunion a few choice specimens from the museum, and members of the Class should send preferences as to early Ming, Ramses, something from Knossos, Karnak, or Troy, but nothing modern, please!

Alexander Kenigsberg, erstwhile Chicagoan, still connected with the War Department, now has taken up temporary headquarters in Kansas City. He and Joe may expect to find mutual pleasure in art or some other phase of K. C.'s abundant life. It will be remembered that Joe and Alec nurtured a common early inspiration in art through mutual difficulties they experienced in attempting to master the

THE TECHNOLOGY REVIEW

intricacies of the calculus under the tutelage of Professors George and the late Dinty Moore.

Overnight from Kansas City lies the promised land of Oklahoma; Tulsa, still asserting its claim of "Oil Capitol of the U. S. A.," is a friendly sort of town, blessed by a plentiful supply of natural gas and hence as clean appearing as Oklahoma City. Tulsa, however, keeps oil wells out of its main streets, and its gently rolling site, suggestive of the not-so-far-away Ozarks, together with the hospitality of its inhabitants, makes it an ideal hamlet in which to sojourn — save during the summer months. Oklahoma City, like Tulsa, has *two* towering office buildings and at least two class A hotels, but members of the Class in Tulsa have no use for any sort of hotel if Dick Lyons gets ahold of them first. As the vice-president of Skelly Oil charged with responsibility of lands and leases, his organization spreads over an entire floor and its influence over just about all of the Southwest. Maps, geologic and topographic, sub-surface and surface, cover all available wall space not taken up by files crammed with documents and slick impedimenta for codifying and posting data so that it will be instantly available when somebody smells a new oil field anywhere between the Panhandle, Gulf, and Southern Kansas.

The aspect of this organization, over which Dick presides with unruffled calm, indicates a smoothly working efficiency which can slip into high gear on sudden notice. It reminds a visitor of Chaumont, the British Admiralty, and the cable terminals of the Associated Press, plus several dashes of J. Edgar Hooverites. There are people with microscopes sorting samples drawn from more than a mile underground, others checking leases and deciding whether to buy more of them, others unraveling reports of scouts as to what competitors are doing, and others concocting forecasts through reading periodical literature — *The Review* was at hand, though the *Literary Digest* was not. By all means visit Tulsa and let Dick's bounteous hospitality lull you into a mood which will permit him to dilate upon its fine points. [Stop press: Dick removed to Houston and joined Tydol about the middle of December.]

Other advices from a Texas agent include second-hand information, through Ramon Munoz '09, of Frank Sada and Eduardo Belden. The former is in the creamery business in Monterrey, Nuevo León, Mexico, while the latter builds most of the new structures which are rapidly being put up in that metropolis of Northern Mexico. Both are said to be well and happy, as is the vice-president of the Emerald Petroleum Company, E. G. Senter, Jr., who favored the Class with his presence at Symphony Hall last June. Ras, along with Frank Bell '10, Dud's elder brother, are two of the busiest men in Dallas, though Ras spends much of his time nursing nine oil wells in a bayou in Lafourche Parish, La. This activity is some 85 miles from New Orleans and quite a longer distance from Dallas. Just

1917 Continued

why Ras finds it less of a strain to live in Texas and operate in Louisiana than to concentrate his energies in one or the other is a mystery. Good authority has it that he is mixed up with certain other oil and gas ventures around Dallas, but it wasn't possible to ascertain whether these were holes in the ground or producers. In Louisiana, though, some 600 barrels a day were flowing in late November, and the bayou being not a long way from the tabasco factory in New Iberia, La., may account for Ras's optimism. Anyhow he is the new secretary of the Technology Club of Northern Texas and visiting 1917 firemen are welcomed.

All through the state of Texas, well-informed natives made frequent reference to a favorite son, a fisherman whose fame must soon spread over the nation. Already he has achieved an honorary title given him first by doughty Gulf Coast fishermen as an acknowledgment of his superiority [See The Review for January]. Over the long coast of Texas, Robert M. Gay, Esq., of Wood and Gay, is known as Backlash Bob. In regions more remote from his favorite range, fishermen speak in hushed, if somewhat skeptical tones of his deeds of prowess as carried to them. Efforts are being made to bring Backlash Bob to the great Northern fishing area for a meeting with the Nova Scotia Tuna Club. It is hoped that he will be found in June somewhere on the New England seacoast between the fishing ports of Gloucester and Boston, probably at Marblehead. If so, he is expected to attend a reunion of his Class at M.I.T., which will then be celebrating its 20th anniversary at the Corinthian Yacht Club.

W. A. Gray, Jr., has joined the E. B. Badger organization located at their New York office where he will continue the practice of his profession of selling refineries. — Bob De Merritt, captain of the Coast Artillery, stationed at Fort Totten, Flushing, N. Y., dropped in at the Institute and spent part of the brief time available in the Dean's office. He promises to give a little advance notice on his next visit and to stay a little longer so that he may see some of the rest of the Boston group.

The official M.I.T. report states that Bob's appearance has changed but little in 20 years, and continues: "This was our first meeting since the War, and I find that, like others of the Class who have stayed with the Army, Bob has been on the Panama-Hawaii — all over the United States shuttle. At Fort Totten, he has command of a battalion and they have been operating for several years a post school to prepare selected enlisted men to take the West Point examinations."

"Bob and others at Totten derive considerable satisfaction from the results in that their pupils have fared well in securing a disproportionate share of the number of appointees sent to the Military Academy annually from the service." — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

1918

Carrying on gallantly from where Mal Eales courageously laid down his burden, Pete Sanger has been awake and stirring early in his efforts to keep the New York brethren organized. News of how the pre-Christmas get-together of December 16 shook the Tech Club at 22 East 38th Street has not yet reached these latitudes, Mr. Farley's minions being busy with other mail.

And — so help me — although all previous efforts have failed, we really did have a dispatch from no less a personage than the Vice-president of the Cyanamid and Chemical Corporation. He was manager and chairman of enough things as an undergraduate to give evidence of the dreadful sting of talent and he never wasted words — no, not even in that thesis title: "The Equilibria of the Higher Oxides of Manganese in Contact with Concentrated Sodium Hydroxide Solutions." (When we were looking this up, the girls in the library catalogue room rolled their eyes.) Well, Phil Dinkins rewarded our fragile communication as follows: "Here's proof that your form letter does have some appeal. My change of address was necessitated by the need for a larger apartment to accommodate a new arrival in the family: Sarah Ann Dinkins, born on October 6. Aside from that, there isn't anything new. The chemical business continues to occupy all my waking hours. I haven't seen many of our classmates recently, but will be glad to see any who care to drop in on the 59th floor at 30 Rockefeller Plaza."

From the same ample address, though under the letterhead of the National Broadcasting Company, comes an accounting from Sherman MacGregory, whose business has to do with wavelengths and the exasperated air. Sez he: "Many times in the past I have received from you a little communication requesting information on my latest form of endeavor, but if my memory serves me correctly, most of these notes have remained unanswered. (Secretary's note: Selah.) Your latest communication, dated November 19, for some reason stirs a more responsive chord in my heart. . . . For some 14 years after leaving dear old Tech-on-the-Charles, I stuck to engineering — just why I do not know. Say that it was probably the line of least resistance. But there came a day when I was able to do what I had really wanted to do through those 14 long years: I seized the opportunity — all of which might be summed up by saying that I kissed engineering a fond farewell and became a radio production director at KDKA in Pittsburgh, where the Allegheny and the Monongahela meet."

"If you were to ask what a radio production director is, I should say that he is the man behind your favorite radio program, the man who takes temperamental actors, annoyed orchestra leaders, and bored announcers and cunningly combines them into a program. To you, who apparently are much more technical-minded than I ever was, it may seem ridiculous after all the labor that went into

four long years at M.I.T. that I should be willing to give it up with nary a qualm of conscience. But I am perfectly satisfied with my lot in life at the moment, save for what might be called the monetary aspects of the situation, which will undoubtedly improve as time goes on. After three years at KDKA I needed a larger field, so I transferred the seat of my activities to New York City. I am now happily ensconced on the second floor of the RCA Building in Radio City as one of the many employees of the great National Broadcasting Company. Having been here in New York for only eight weeks, it is, I fear, a trifle early to expect word of my fame to have reached far beyond Times Square, but we are anticipating in the vast field of radio a future which will be something weird and wonderful. Details of said future, however, are not available at this writing — thank heaven, perhaps! . . . May I, in closing, extend to you and to my fellow classmates my sincere felicitations and good wishes."

At a conspiratorial gathering of the Worcester Tech Club on December 9 we saw Tom Kelly of Gardner, Mass. He is still resting solidly on his Lilly Varnish record; reports that the three daughters and two subsequent sons are all flourishing mightily. Pressed for comment on the missing boy necessary to balance a sextet, Tom intimated that there was unfinished business awaiting the Secretary's attention elsewhere.

The Review Office perversely persists in sending us newspaper clippings, the latest being from the Waterbury, Conn., *Democrat*. From an obscure inner column it proclaims: "Professor F. Alexander Magoun of the M.I.T. has been secured by the industrial committee of the Y.M.C.A., working in conjunction with the Industrial Foremen's Club, for a series of six lectures on psychology and management." — F. ALEXANDER MAGOUN, *Secretary*, Room 4-136, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1919

We had our dinner and get-together of those in the Class around Boston on Friday night, December 4, at Walker Memorial as planned. The turn-out of 19 members was most gratifying; the following were present: Jim Holt, Bob Bolan, Alan Richards, Don Stockbarger, Maurice Goodridge, Roy Burbank, Eaton Webber, Joe Newell, Bob Hackett, George Michelson, Morris Berk, Rod Blood, Bill Bennett, Bill Gagnebin, Art Blake, Harry Cikins, Bill Banks, George McCreery, and your Secretary.

After dinner in the Grillroom, we had a business meeting and elected an executive committee and a reunion committee of the Boston section of the Class. It is our earnest wish that similar groups be formed in other key cities, particularly New York, to cooperate with this group in reactivating our Class and assisting in formulating plans for our 20th reunion. Three members of the Class in New York City were included in the reunion com-

1919 Continued

mittee as noted below, to arouse interest in New York and obtain ideas from that section. The executive committee is as follows: Jim Holt, chairman, Art Blake, vice-chairman, Don Stockbarger, Alan Richards, and George Michelson. The reunion committee includes Bill Banks, chairman, Art Griffin, vice-chairman, Bill Bennett, Bob Hackett, Maurice Goodridge, Art Kenison, and the following from the New York area: E. R. Smoley, The Lummus Company, 50 Church Street, New York City; Ellsworth G. D. Paterson of Bell Telephone Laboratories, 463 West Street, New York City; and Don Way of the Diehl Manufacturing Company, Elizabeth, N. J. Your Secretary is also a member of both committees. The meeting of the Boston bunch was so successful that it was decided to have another get-together in March.

Approximately 75 out of 472 questionnaires have been returned up to December 4 with \$55 for dues, out of which we have paid the Alumni Association \$18.21, which merely covered postage and paper at cost. All labor in this connection was donated by the Alumni Association, and Professor Locke '96, Secretary of the Association, has been most helpful and cooperative. The returns from New York City are coming in slowly. I received a corking letter from Ellsworth Paterson written on the back of his questionnaire. Pat is still a member of the technical staff of the Bell Telephone Laboratories and has a boy, Donald, three years old. He is still possessed with that erroneous feeling that he can take your Secretary at pool or billiards! He extended congratulations at the appearance of 0.631459 columns of class notes in the December Review, which proves he is still technical out to six places of decimals. Pat states that there are several classmates at the Bell Laboratories, viz., Fred Given, Karl Rodgers, Al Reynolds, Ted Shea, and Ernest Schwartz. You are on the reunion committee, Pat; get after these fellows and get those questionnaires sent in!

Why don't a few of you arrange to have a class get-together in New York, as we did in Boston? If you will pick a date and place and send me the details, I will have the Alumni Association strike off mimeographs and send copies to all members of the Class in the vicinity of New York. We are particularly anxious to obtain the feeling of the New York crowd as regards location for the class reunion. It was the feeling of many in the Boston group that we should cooperate with the Institute and have our reunion near Boston so that we could also take in the alumni week-end activities which come the first part of June. This has the advantage of enabling us to meet again many familiar faces in neighboring classes.

I received a fine letter from Paul F. Swasey who is district sales manager of the Virginia Electric and Power Company, Fredericksburg, Va. Paul has a daughter, Joanne, aged 10. He was very glad to hear of the Class coming to life

and intends to renew his subscription to The Review in order to see the class notes. The moral to this, fellows, is to call up classmates in your vicinity and tell them to send in their subscription to The Review if they are not taking it already, since this is by far the most satisfactory method of disseminating class information.

George McCarten came through with a fine letter on the back of his questionnaire. He is chemical engineer of the Calco Chemical Company in Bound Brook, N. J. I was sorry to hear that George has lost his wife and extend the sincere sympathy of the Class. He has two children: Jean, 10 years old, and Peggy Ann, six. He took in the Army-Navy game with George Fleming, who is now with the Hartford Specialty Company in Hartford, Conn. George occasionally sees Doc Flynn, X, who is at Palmerton, Pa., with the New Jersey Zinc Company. — ARKLY S. RICHARDS, *Secretary*, 26 Parker Street, Newton Centre, Mass.

1921

Every once in a while the arrival of news of the clan calls attention to the wide diversification of occupations or to the many fields which are served by those with a background of science, engineering, or architecture. Let us hasten to set Bob Dolle's fears at rest, however, for nothing at hand or on the horizon seems likely to displace our own successful Cincinnati goldfish farmer from his leading position among Institute Alumni as possessor of the most unique occupation! — From S. K. Skolfield, dean of Northeastern University Law School, we learn via The Review Office that Francis T. Hill is enrolled as a member of the second-year law class. Frank is manager of the compensation and liability department of the Maryland Casualty Company, 40 Broad Street, Boston.

A short note from Saint relates that he ran into George Thomson in Boston recently and George reported that Carl T. Leander is now a dentist in Lexington, Mass. Carl's last address was 335 South Huntington Avenue, Boston, and this is notice to him that an accounting of his recent doings is now due and should be sent in promptly. — Edward W. Booth has been with the Cities Service Refining Company since 1923 and is now manager of the fuel division in Boston. Scripps lives at 51 Pine Ridge Road, Waban, Mass. He was married in 1925 and has a fine little daughter. This being a busy season for Scripps, even our mention of "ad libbing" Grecian urn jokes for Tech Show at Northampton failed to rouse him from the perusal of viscosity tables and his only statement was: "Still competing with Norman Patton against coal." Speaking in his own defense, Norm Patton says: "Am taking a pass at coal bootlegging every rainy Thursday. Working with and for Anthracite Institute, 19 Rector Street, New York City, and — (deleted) with Booth and his fuel oil!" Incidentally, Norm pleads guilty to being one of the few still enjoying blessed singleness.

Recent changes of address include: Major Ralph G. Barrows, 458 East Fairmount Avenue, State College, Pa.; Spencer W. Butler, 410 Hanna Building, Cleveland, Ohio; T. Dillwyn Dutton, 409 Arden Road, Mount Lebanon, Pittsburgh, Pa.; James B. Ford, 316 Virginia Street, El Segundo, Calif.; Thomas F. Hickey, 149 East 37th Street, New York, N. Y.; William B. McGorum, Box 364, Charleston, W. Va.; Simeon E. Travis, Jr., WPA Supervisor, Airport Engineering, 1604 Tower Building, Jackson, Miss.; Harry M. Witherow, Miller Road R. D. #8, Fort Wayne, Ind.

Is your letter in the mail to cheer the long winter nights for your Secretaries? — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N. J.

1923

Pete Pennypacker has some news to offer: There is a new girl in the Pennypacker family. — Bobby Burns, who when last reported was building a water supply system for the county borough of Swansea in Wales, is the subject of the following extract from a letter from Pete: "Since July Bob has been in Cambridge, England, in connection with a project involving 500 miles of rivers and the drainage of some 3,000 square miles in the vicinity of Cambridge. He reports that the area directly under his jurisdiction is about 1,500 square miles and he has numbers of men in different places building dams, weirs, sluices, and doing river work generally. This is in addition to design and research work carried out in a special hydraulic laboratory."

By the time this material appears Bob will be on his way to Ceylon. He and Mrs. Burns started out on January 14 from Liverpool and hope to arrive in Colombo on February 8. Bob explains that the British government invited him to take the post in Ceylon where his work will also be in hydraulic engineering, since he will be the director of hydraulic research for the Island. When he wrote to Pete, he and Mrs. Burns were enjoying the pleasant confusion of vaccinations and inoculations preparatory to their trip, and Bob was running about to Germany, Wales, and Ireland to clean up a few last-minute matters before leaving. I used to be surprised every time I heard of Bob's turning up in a new place, but I refuse to be amazed at anything he does in the future.

From New York City comes an announcement of the marriage of Marie Kathleen Furey to Girard Boyce on Saturday, November 14. — Your Secretary is writing this from San Francisco, Calif. He had the pleasure of saying hello to Bunny Kingsley in Los Angeles, to Frosty Harmon in San Francisco, and to Lance Hanson in Berkeley. They all have responsible positions with some of the West Coast's large industrial units, their interests being, respectively, soap, steel, and culverts. — HORATIO L. BOND, *Secre-*

1923 Continued

tary, 195 Elm Street, Braintree, Mass.
JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

1924

What seems to be a combination of inquiry and challenge came to the Secretary from Paul Cardinal a few days ago. Says Paul: "Here's a little item for you in the announcement of our fifth addition in the person of Richard Albert, who arrived at 7.30 A.M. on October 23, tipping the scales at seven pounds, ten ounces. This brings the score up to two girls and three boys, as you will recall, and I am just wondering, out of curiosity, whether anyone in the Class can beat this record. Of course, it would be easy if they happened to have quintuplets." Well, who will be the next to speak up? If it is desired to go round the end on the Secretary, Paul may be reached at 14 Albion Street, Passaic, N. J., where the Secretary spent an enjoyable evening recently.

From Professor Locke '96, who certainly keeps in touch with his former students, we have the following note: Ray Meade reports that when he cleaned up his work with the Mississippi Gas Company last year he found himself out of a job, but he found some temporary work with the Republic Steel Company in Alabama during the winter. In the spring the Southern Natural Gas Company had a little work for him, but about the first of last July everything was finished, and he went down to Mobile and bought a boat, and Mrs. Meade and the child and Ray fished and crabbed and took life easy until the first of November, when he went with the Tennessee Coal, Iron and Railway Company, a subsidiary of the United States Steel. This company is building a tin-plate mill and accessories at a cost of thirty million dollars. Meade is construction engineer on the work which is expected to take about two years. He is living at the Molton Hotel in Birmingham. — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

1925

Sam Caldwell, Professor of Electrical Engineering at the Institute gives us the following: Notable at Harvard is Ken Bainbridge; back last year from South America, where he has been with the International General Electric, came Ned Lynch, who is now in Lynn; of Selsyn fame at General Electric is Jim Woodward. Tom Killian is with the Luminous Tube Lighting Corporation, Seattle, Wash., and we understand that Frank McGinnis is with him. — Al Kullman is very active for Graton and Knight in Worcester. — Rufus Palmer is back at the Institute as a graduate student, studying ceramics.

Ted Steffian and Freddie Winsor have mutual architectural offices in Boston. — Ralph Head at Ithaca is sometimes heard of. — Beside Sam Caldwell and Rufus Palmer at the Institute are: Frank Foster, Horace Mann, Glen Gilboy, Tom Camp, and Charlie Blake, all professors. — HENRY V. CUNNINGHAM, JR., *Secretary*,

43 Chestnut Street, Boston, Mass. HOLLIS F. WARE, *Assistant Secretary*, 25 Valley Road, Medford, Mass.

COURSES III AND XII

A personal call from President Price reminded me that I should get on the job and report upon the whereabouts of some of our wandering miners, metallurgists, and geologists. — I. M. Symonds has just recently reported concerning his activities with the Compania Minera de Penoles in Mexico. He has been the mill superintendent for that company at Avalos, Zacatecos, for nearly two years and has had many flotation problems, as well as problems in mill design, which had to be solved. Apparently, as mill superintendent he has many things to care for in addition to the mill, for I understand he is in charge of the railroad, looks after all the company houses, and serves as police chief of the town. — J. G. Creveling is still with the Huanchaca de Bolivia Company, being their mine superintendent at Pulacayo, Bolivia. — G. A. Marsh, as reported a couple of years ago, is in business for himself in Arlington, Mass.

J. L. Maury was appointed mining engineer for the Securities and Exchange Commission in April, 1935, and is still on that job. His headquarters are at Washington, D. C., but his work keeps him on the road a good deal. — Ralph Ilsley has been with the Petroleum Administrative Board since receiving his doctorate in geology in June of 1934. His headquarters were also in Washington, D. C., for a while, but at present he is located in Philadelphia. — Another of our Class, G. W. Noble, received a doctor's degree in 1936. His degree was in mining engineering, with emphasis on petroleum production. He is at present located in New York City, employed by the Standard Oil Development Company.

H. T. Mann and M. J. Buerger continue their good work at the Institute. Professor Mann, in line with his work in petroleum engineering, made an extended visit to the oil fields of Kansas, Oklahoma, and Texas during the past summer. Professor Buerger, in addition to his instruction work in mineralogy and crystallography, is carrying on several researches in his field and, during the past year, has had a number of papers published in American and German periodicals.

No account would be complete without something about G. B. Blonsky and, as usual, he has done some further moving about. A little less than a year ago he severed his connections with the Dorr Company and after a month or so was taken on by the A. O. Smith Company of Milwaukee, Wis. He has been working in the research laboratory of that company since last June and is located at Shorewood, Wis. — F. LEROY FOSTER, *Secretary*, Room 6-202, M.I.T., Cambridge, Mass.

1926

Lo, the poor class historian, whose solemn duty it is "with unswerving inaccuracy to predict the past." That the members of such an illustrious Class as

ours should be so thoroughly preoccupied by the shifting panorama of events that not one stray item has seeped through for a whole month to aid the Secretary in filling out his column is unthinkable. Sunk without trace. With Sinclair Lewis we would have said that "It Can't Happen Here," but with Margaret Mitchell we must now confess that you have "Gone with the Wind."

Just to keep the continuity intact, we decided that this issue would afford an excellent opportunity to report on the many '26 men who are devoting time and energy in the interests of Technology and its Alumni Association by serving on various alumni committees or as officers of local clubs. The report of the M.I.T. Association of Buffalo on page III reveals that John Marshall Gaines, Jr., is the new vice-president of that organization. Also in this issue (page IV) is a report of the first meeting of Alumni residing in the vicinity of Port Arthur, Texas, who aim "to promote good fellowship and the name of M.I.T. . . ." Present at this initial gathering was Theodore A. Mangelsdorf.

The Alumni Association, of which your Secretary is treasurer, allocates its work among several committees. One of the five members of the committee on assemblies is A. W. K. Billings, Jr., of Wellesley. Three of the Class are serving as members of one of the Alumni Advisory Councils for Undergraduate Activities: Eben B. Haskell of Bedford, Mass., on the Council for the Boat House; William P. Lowell, Jr., of Newburyport, Mass., for the Musical Clubs; and your Secretary, who is chairman of the Council for Undergraduate Publications. Haskell is also the class representative on the Alumni Council, and your Secretary is one of the two alumni representatives on the Visiting Committee for the Department of English and History.

" . . . Appointed by President Compton to act as academic ambassadors of the Institute in their communities. . . . interview and assist prospective students, cooperate with the Institute's Placement Bureau, and in many other ways contribute to the well-being of Technology and its Alumni." Thus does the Alumni Directory describe the functions of the group of Honorary Secretaries of M.I.T. Intrusted with these duties in their communities are Thomas D. Green of West Hartford, Conn., and F. Gurney Fine, Jr., of Bryn Mawr, Pa.

No less than six members of the Class have been elected secretaries of their local Technology Clubs: At the monthly luncheon meetings of the Atlanta Alumni Association of the M.I.T., the minutes are taken by Oliver R. Etheridge, while at the meetings of the M.I.T. Association of Cleveland, this function is the duty of Duryea E. Elmendorf. Secretary of the Detroit Technology Association, which has a dinner meeting each month, is John E. Longyear. The Technology Club of Central Pennsylvania, which meets at the Harrisburg University Club every Tuesday noon, has elected Maurice W. Davidson secretary-treasurer. George A.

1926 Continued

Fogg of Hartford, Conn., and John R. Kimberly of Neenah, Wis., serve their local clubs in this same capacity. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

1927

On a cold, gray February day one is not enthusiastic about clam bakes, deep-sea fishing in Massachusetts Bay, golfing-by-the-sea, or class picnics, but clear, bright days are ahead when the sand is warm and the smell of the sea is good, when we can bask in the sun and listen to tall tales of mining in Africa, of oil in Colombia, of flood control on the Mississippi, of power in Tennessee, and of Passamaquoddy's ill-fated attempt to control the tides; then we shall hear of wives and children, of successes in Peru, of conquests in Mexico, and of Joe Harris' sweetheart. So get ready for our tenth reunion; it will be a holiday that will start with chuckles and end with some wondering, much laughter, and many memories.

There is already great planning and much preparation. One of our colleagues, who has become a well-known figure on Broadway, telegraphed the proposal that he would bring the entire cast of the Ziegfeld Follies of 1936, disguised as the cast of Tech Show 1927. We were forced to dissuade our well-beloved classmate for fear that the cast of Tech Show 1927 would object to such caricature. Of course, if the members of Tech Show 1927 will write their approval, we shall certainly have at least the Ziegfeld chorus present on June 4 and 5.

Larry Grew, who recently took over the duty of rounding up news concerning VI, VI-A, and XI men, has been able to supply the following about men who have not been "checked in" for some time: J. K. Donald and his wife spent May and June of last year making an extended tour of England. They enjoyed the trip over on the S.S. *Berengaria* and the return on the S.S. *Queen Mary*. They recently moved to 37 Chase Avenue, White Plains, N. Y., from London Terrace in New York. Dick is in the business-forecasting end of the American Telephone and Telegraph Company's long lines department. — J. B. Snediker became, as of June 1, district plant superintendent of the Transpacific Communication Company, Ltd., with headquarters in San Francisco. A news clipping tells of Snediker's participation in the first ship-to-shore communication between the Japanese Mail Steamship Company Line and the San Francisco station when the service was extended to this line. — Dick Cutts is meter specialist for the General Electric Company and resides in Mount Vernon, N. Y. — Weed and Church are reported to be with Boston Edison where they have been for some time. — Joe Hammond is with Barss, Knobel, and Young, consulting physicists, in Cambridge. — Larry wrote of a pleasant vacation trip to Arcadia National Park, Bar Harbor, Maine, and return by way of Moosehead, Mount Washington, and other scenic points in

New Hampshire. Larry may be reached care of the Southern New England Telephone Company at New Haven, Conn.

Your Secretary saw George Bergman a few weeks ago and, as previously reported, George is representing Sullivan Machinery in St. Louis and is really doing that part of the Midwest. George has made all of the necessary plans to be at the June reunion and he brought along similar assurance from Frank Mesker, who continues to make all types of metal door and window frames and sashes. In fact, your Secretary has been assured by the following that they would be back if at all possible: Tom Russell, Warren Smith, Car Whittier, Bill Reed, Dyce Coburn, Maurice Davier, Dan Metzger, Larry Grew, Bruce Sherrill, Jim Lyles, and, as previously noted, Bergman and Mesker. As no sales effort was even attempted on these men it looks as though in these new days of prosperity that we shall be back if not too busy being prosperous. — RAYMOND F. HIBBERT, *General Secretary*, Care of Johns-Manville Corporation, Waukegan, Ill. DWIGHT C. ARNOLD, *Assistant Secretary*, Arnold-Copeland Company, Inc., 222 Summer Street, Boston, Mass.

1931

Gil Roddy, chairman of the five-year reunion committee, has forwarded the report of the reunion held last June 6 and 7. There were about 20 men in attendance, although from the returns to the questionnaire the committee had anticipated a larger gathering. The group gathered at Crafts Library about 2.30 p.m. on Saturday and proceeded to the Hotel Mayflower in Plymouth. At the banquet that evening Professor William C. Greene was the main speaker. Aside from the banquet, the members of the Class sought their own diversion. On Sunday morning, golf, swimming, and a baseball game preceded luncheon, which was held jointly with the Class of 1911 which was also holding its reunion at the Hotel Mayflower. After luncheon, pictures were taken and the party broke up during the afternoon, most of the members of the Class attending the Alumni Day exercises at the Institute on Monday.

The reunion was not a whale of a success, so far as attendance is concerned. However, the committee put in a lot of work and time in organizing the party and attending to the many details. On behalf of the Class, I want to thank Gil and the members of his committee for their work in putting over our first reunion and also for the excellent report which should prove of immense help in preparing for our ten-year get-together. Those serving on the committee appointed by James B. Fisk, then Class Secretary, were: Roy W. Chamberlain, Ralph Davis, James B. Fisk, George C. Humphreys, John M. MacBrayne, Jr., Victor C. Studley, Elliot L. Whitaker, and Gilbert M. Roddy, chairman.

A Paris extract from the New York *Herald-Tribune* tells us of the marriage of Miss Gladys M. Sperrle, daughter of Mr. and Mrs. Oscar E. Sperrle of New

Brighton, to Horst Orbanowski. After finishing school and working at the Fore River Works, Horst returned to his home in Düsseldorf, Germany. His bride is a graduate of Staten Island Academy and Smith College. She received a master's degree in political science from Columbia.

News has been rather scarce, but I expect better results in the near future. The various Course Secretaries are being contacted and some replies should be in for our next article. — BENJAMIN W. STEVERMAN, *General Secretary*, 11 Glenland Road, Chestnut Hill, Mass.

1934

This month, being the shortest month of the year, will probably be accompanied by the shortest notes of the year, since we have not as yet received the fruits of our news-gathering activities. At one place or another I am fortunate in seeing 1934 men. Those I have met have given me a few things of interest.

In the National Shawmut Bank I met Leland Person, who gave me the following notes on several of the Class, modestly neglecting to write anything about himself: "Phil Walker, Jr., IV-A, was transferred on the first of September to the San Francisco office of the United Mutual Fire Insurance Company where he will continue his work as engineer in the inspection department. — Jack Andrews, XV, is still with the McGraw-Hill Publishing Company as one of the editors of *Factory Management and Maintenance*. We understand that he is still unmarried though he is definitely exposed to the disease. — Dave Ingalls, II, is going great guns for the Titeflex Metal Hose Company in Newark, N. J., and according to reports has been traveling around telling their people how to sell the product. John W. King is working for Cooley's, Inc., in Boston. Bob Grosjean is with the Birds Eye Frosted Foods and was traveling around Europe when last heard from. (If Bob gets within reach of this copy of The Review, will he please drop me a line telling all he knows of himself and his travels.) — Gordon A. Danforth, VI, is the proud father of a daughter, Sandra, born this summer. To celebrate the happy event he passed around the traditional cigars and stopped shaving his upper lip. Apparently his daughter objected to the fuzz because he recently gave up trying to develop a soup strainer.

At the recent Alumni Council meeting at Walker I met Edgar Chiswell, Jr., who has gone matrimonial on us. The event occurred on December 26, 1935, at Washington, D. C. The very charming young lady is the former Miss Hester M. Payner of that city. Ed will receive his Sc.D. in Chemical Engineering in June. The Standard Oil Company of California was very fortunate in securing Ed to work for them, starting last month in their research and development department. (We 1934 men are modest at any rate.)

While mentioning marriages, I suppose I should add that I, too, was lured into the fold. (Lure is not just the word when we who have taken the step really have to admit that we were all tickled to death

1934 Continued

when *she* said "yes.") Last June 19 I went down the last mile, so to speak, in Belmont, Mass., and then we departed for Bermuda and the West Indies. The young lady was the former Lois Pringle of Belmont and Montreal. At present we are located in a small apartment near Harvard Square, Cambridge — 18 Ware Street for those of you who will drop in to see us when in Boston and can come out for a while.

The engineering firm of Jackson and Moreland is becoming quite an M.I.T. electrical engineers' headquarters. In recent months, Henry Backenstoss, VI-A, Beshara Battit, VI, and Maurice Marshall, Jr., VI, have taken up their work there, adjoining the Gulf Oil offices in the Park Square Building, Boston. For that reason we see each other more frequently and I hope to have some notes from them and other Course VI men in the near future.

Dick Bell, our Class President, has recently written a nice letter volunteering his help. I hope that you fellows will get back of Dick and me to see that 1934 is well represented in alumni activities and class notes. Consequently, I shall repeat my suggestion of last month to drop me a penny post card and, following that, a letter with news of yourself and those whom you know who are in interesting work, news of those who are married and to whom, and any other material you consider of interest to 1934 men.

[Before learning of William Ball's recent appointment as Assistant Secretary, Robert M. Emery submitted to The Review Editors the following notes about members of the Class living in the New York area. They are given here without quotation marks, for simplification.]

For many months it has been a source of keen disappointment to our class members that no news has been forthcoming in The Review. Had the boys known that our General Secretary, Robert C. Becker, had been temporarily mesmerized by a combination of Andean moonlight and the blue eyes of his English mine superintendent's daughter, they might have understood. But only silence has issued from his hacienda high in the mountains of Bolivia.

Two letters lie before me: one from Dean Dadakis, that old news hound and editor of *The Tech*, who reports: "Ed Geittmann, XV, spent three months during the past summer at the General Motors Institute in Flint, Mich., learning the ins and outs of their accounting methods. Now he is with the accounting department of Chevrolet in Detroit. In his own words 'it is interesting stuff and offers an opportunity to pack away much valuable experience.' — Francis Doyle, XVI, is with Boeing in California. While still at Technology he won a scholarship at the Boeing School in a nation-wide essay contest. After finishing his course at the school, he immediately got a job with the company in their design department. The California climate agrees with him admirably, and he has done considerable aerial exploration of the surrounding territory in a small Aeronca in which he bought a part interest."

Dean goes on with his own history: "I joined Oxweld immediately after graduation. The plan was to learn the business from the ground up by spending a few months in each department. I spent a couple of months in the inspection department, about a month in the testing, and then was transferred to the assembly department. About this time the company was hit by a tremendous wave of orders and all hands were pressed into service. I stayed in the assembly department, first as an operator, then as a setup man, and for the past year as assistant foreman. A few weeks ago I was transferred to a newly formed branch of the engineering department known as manufacturing research. Our job is to shoot trouble as it crops up in any of the operating departments, and also to study our manufacturing technique with a view to increasing quality and decreasing costs. The work is very fascinating and offers much valuable experience."

A letter from Page Golsan, Jr., reports: "Chuck Schauer was married in Toronto in September and is working for the Philadelphia Electric Company. Sam Crew was married in November and went on a honeymoon trip to South America via United Fruit. He owns and operates the Samson Engineering Company in Cincinnati, and has been very successful this year, having built several small houses and apartments. Harvey Chess was married in December. Floyd Carpenter swears that his intentions are still to remain single; however, who can tell? Floyd works for the Aluminum Company of America in New Kensington, Pa. He's in charge of the railway division of the development department." Page himself is married and has a very nice job as assistant power engineer, Plattsburg division, New York State Electric and Gas Corporation.

Engagements, marriages, and births seem the order of the day among our classmates. Lots of you know that Charlie Lucke married Miss Agnes Eaton and they now have an addition, Jane Clifford Lucke. They live in the Bronx, and Charlie has a very fine job with the Wilson Mechanical Instrument Company, makers of the Rockwell hardness tester with which we struggled in testing materials laboratory. Gordon Day married Miss Eleanor Greenlaw and whisked her off to Vicksburg, Miss., where he is engaged in controlling future floods on Old Man River. Butch Patch and Spike Jewett became more or less related when they married sisters, the Misses Helen and Olga Forslund of Mattapan, which makes it a clean sweep for Course I in the Forslund family. Butch is doing nicely with the Linde Air Products in Newark, while Spike, just back from roaming the Caribbean countries, is working for Tropical Radio at Hingham, Mass. Eddie Chiswell, too has gone and done it, the girl being Miss Hester Raynor, that dark-eyed beauty with whom he used to waltz so serenely at Walker. Phil Kron and Johnny Moomaw are reported engaged (not to each other!), but the names of the misses are not known. Johnny is working

for Krebs Paint and Pigment and was last seen in a ski shop buying skis for the one and only. You may expect to see them both swooping down any of the more dangerous ski trails of the East. Phil Kron is doing his best to keep the Eastman Kodak Company running smoothly. Not long ago he came to New York City on business (he must be a big shot), and a very pleasant reunion was had by several of us at the German-American Athletic Club. Phil reports that George McCauley works for Eastman in Rochester, but that doesn't keep Mac from dashing over to the White Mountains on week-ends to try his ski technique.

Wally Bird is on temporary leave from the Pullman Company while engaged in getting his master's degree in business administration at Technology. Bill Dobbins was working hard as assistant in Course I when an offer came from Robert College in Istanbul, Turkey. With no more ado he jumped on the S.S. *Queen Mary* and is now teaching hydraulics in the land of veiled women and water pipes. Henry Humphreys is reported to have a fine job with the American-Hawaiian Steamship Company. Freeman Hudson and Ash Woodhall both work for Colgate-Palmolive Peet in Jersey City, N. J. John Borger is working for Pan American Airways somewhere in the Pacific. Chuck Jerome and Walt Wrigley are still proving the mainstays of International Printing Ink Corporation. Bill Butmi is working for the government in the erection of some massive structure in the Bronx. Bill Main lives in Pleasantville, N. Y., works for the New York Central in the electrical division, and can be run into at lunch time around the Grand Central area. Choo-choo Moore was last heard from while touring Europe in a rigid inspection of foreign railroad systems. Sam Joroff, who used to work for his father, is now an inspector for the Liberty Mutual Insurance Company and can be seen around any of the larger building projects in New York. Fred Judd has gone quite high-brow on us and now lives in a penthouse on Fifth Avenue. He's an assistant to the chief engineer of the R.C.A. plant in Harrison, N. J. Moose Brown is working for the Mellon Institute in Pittsburgh and getting his doctor's degree on the side.

Larry Stein has severed relations with the Board of Transportation and is now helping the New York Central Railroad get on its feet. He has become quite a yachtsman of late and has had several adventures, such as being rescued by the Coast Guard, washed overboard, and so on, but let him tell it to you down at that great old Tech hang-out, the German-American Athletic Club. — Johnny Newbegin is coming right along with his job in the paper mill at Rumford, Maine. Besides being a volunteer fireman and sliding down the pole to work each morning, Johnny is running the finest ski shop in Western Maine.

Proctor Wetherill works for Krebs Paint and Pigment in Wilmington, Del. Much to the envy of all of us he spent the summer touring the West and climbing all

1934 Continued

the highest mountains in the Rockies, but he's now kept pretty busy mixing paint all day and trying to teach Johnny Westfall to play bridge at night. Johnny, incidentally, is living in Jersey City, N. J., with Al Rogowski, Gordon Way, and myself. He works for Linde Air Products Company and is at present on the road for them in the guise of an inspector. One of his stops is Wilmington, where he and Proctor get together in one of those bull sessions for which both are famous. Way and Rogowski are both rising young development engineers for Worthington Pump. Al has been with the company for some time and has done some very fine work in connection with projects as widespread as Boulder Dam and Russia. Gordon, the old Colonel, has just recently joined the company after a year of promoting his own inventions. Neither lad has lost his skill in a tuxedo at *cherchez la femme*.

A few last minute news flashes report that: Manny Sayles has married his childhood sweetheart; they have set up house-keeping in one of Omaha's suburbs; Manny is an executive in the Bemis Bro. Bag Corporation. Also current is a report that Man-mountain Schumacher is an independent oil operator in Texas. If Jesse hits a pool half as big as himself he ought to be in the money. — ROBERT C. BECKER, *General Secretary*, Compania Huanchaca de Bolivia, Pulacayo, Bolivia, S. A. WILLIAM G. BALL, JR., *Assistant Secretary*, 18 Ware Street, Cambridge, Mass.

1935

Betrothals are still occurring regularly: Fred Paul and Ruth Mary Farrell were wed, November 19; Randolph Strickland and Marjorie O'Brien were married, November 25. By the time this issue is delivered Don Morrison and Abba Eleanor Barrett should be man and wife; so also should Sal Pagliuca and Viola Amaru. We extend our best wishes to these couples and hope that they will enjoy the best of connubial bliss. Incidentally Strickland is a research engineer for the Detroit Aluminum and Brass Company. Along the general line of births, marriages, and so on, it is a pleasure to congratulate Mr. and Mrs. Jack Orchard for a "new skipper at the helm of their family," born November 19, name: William John Orchard, II. I don't know whether to wish him a four-year term at M.I.T. or not; guess we had better leave that up to the fond ma and pa.

It seems that another of the gang is not satisfied with the extent of his education: Bill Mahoney is enrolled in the Law School of Northeastern University. — The only bit of news I could dig out of John C. Nelson was that he is working for "an architect" on Newbury Street in Boston. Turning to the letters received during the last month: Roger Hammond writes that he is still working for the Mack Molding Company in Montclair, N. J. Rog says that he likes his job and the bosses seem to like him just as well. He reports that Dave McIntosh (married, with a son to carry on the tradition) is a

foreman in the molding room. Rog also mentioned that Sam Brown is working in New York in the cooling tower division of Research Corporation. The only event of note in Rog's existence was the removal of his appendix.

Miller Wachs dropped me a line which said the most important event in his young life occurred on August 5 with Margaret Kinsman providing 51% of the personnel required to produce a married couple. Miller has been working in the analytical department of The Aviation Manufacturing Corporation, Williamsport, Pa. Leonard Wiener has been working with him for over a year. I gather that they are the boys who solve the problems for the engine and propeller departments. — A letter from Fred Kraus reveals that he has been working for the Henry Vogt Company in New York since he received his M.S. last June. Fred is in the heat exchanger department designing and estimating. Fred mentioned that Al Frank is working as a chemical engineer for American Distilling Company in Philadelphia; Ed Kass is back at school studying sanitary engineering. — Irv Banquer wrote to me in November and at that time said that the school and club jewelry business was picking up. Irv has been running his own business now for over a year. The biggest item of news was his marriage to Evelyn Shenfield. Irv and Evelyn have visited Ham Dow and his wife frequently.

Dick Lawrence sent me some news, mainly a quotation from a letter by Herb Thomas, which I will proceed to quote: "I see by the last Review that somebody saw my duty and did it for me. Thanks a lot, somebody! However, since the job is started I may as well finish it and give a bit of news. My luck changed last April when I left the ice cream business, in which I had been employed since graduation, to go to work for the neumatic Scale Company, located in Quincy. This company makes automatic machinery of all sorts. At present I am working in the drafting room trying to find out what makes the machines do what they do. It is an interesting job and I am learning a lot about machine design every day. As counteraction to my good fortune in finding a job, I went and got married last June. However, my head is still above water, although not very far. . . ." The rest of Dick's letter follows: "Since last writing I have come across Guy Haines who is with Fairbanks Morse here in Boston. That noble Democrat, Walter Daley, walked into the office about two weeks ago preaching New Deal economy (?). He is now with the Boston Edison Company. As a sales engineer, his job is to visit the customers' plants and show them how they can cut their juice bills in half by buying two or three transformers and having an electrician rewire their plants. In our plant the saving is only \$380 a year and the initial cost about \$800. I have him working on a way to save us the \$380 without the initial \$800. The only other person I have seen is Bill Cross, who has since moved to New York."

Perk Ehrlich came through this month with a swell list of information about the chemists, in fact he sent two letters. Here they are: "The fellows seem to have been very reticent about sending in news, so I will try to bring you up-to-date as far as I can — though in so doing I expect retaliation from the pens of furious 'Fivers.' Bill Abramowitz, formerly of Lakehurst, N. J. — home of the *Shenandoah* and the Abramowitzes for generations — was visiting at M.I.T. during the summer. I was working in Eastman Building on my thesis at the time. . . . [Bill revealed that he finally took a job in a perfumery] whose esthetic atmosphere and good salary appealed to him. After about four months the lesser esthetics, but greater salary, of the Universal Oil Products Company at Harrison, N. J., appealed to him. He lives right across the river in Newark, and drives in each morning, we are told, in his boss's car. This is a minor compensation; the job is a strenuous one, and Bill works with his customary fiendish energy from any hour in the morning to every hour at night and thrives on it. We have a clear recollection of Bill at M.I.T. working over an autoclave in an atmosphere of SO₂, yet with a godlike serenity. — Ben Blocker enjoyed several months of unemployment after leaving Tech. Then he landed a job in the newly established research department of Rushcraft in Boston, doing work on lithography. Rushcraft is one of the largest companies in the field, and Ben's position in it is strategic, with immense possibilities. . . . It has been rumoured that he has intentions of leaving the ranks of the bachelors.

"Paul Goldberg has been away at Army camp the past summer. At M.I.T. a year ago he registered as a graduate student in organic chemistry, doing research work under both Blanchard '98 and Gamble '30. We'd like to see him continue, but perhaps he intends to join the Army. — Leo Epstein has been having the lousiest luck. After having written to practically every eligible company in the U.S.A. and receiving a whole portfolio of letters of refusal (the variety is something to be admired), he has decided to study for a Ph.D. (in physical chemistry, I think) at Tech. . . . For all the rotten luck, his morale is still holding out.

"Gordon Gott (technically IX-A) started work right after graduation in the Consolidated Gas Company in Everett, carrying on control analyses. Before the end of the year he had switched to the Dewey and Almy Chemical Company in North Cambridge. This company is increasingly progressive, with an increasing number of patents and a broadening line of products. Gordon is making a systematic study of the factors involved in the production of rubber goods — and, of course, the details can't be discovered. . . . Charlie [Ross] landed a position with Imperial Paper and Color Corporation in Glens Falls, N. Y., right after graduation. His reticence about details of the work makes it appear that he is doing research. Lately, however, he seems to have been acquiring an interest in hiking and

1935 Continued

mountain climbing. If he makes use of all the opportunities Glens Falls offers him, he will probably decrease to the proportions of a file card. Glens Falls is in the center of New York's beautiful lake-mountain-river region, whose scenery is bound to sensitize even his toughened soul, while those mountains are bound to toughen his sensitive soles. (Paawdon me!) Fred Haigh for a time worked at Imperial also. When I last ran into him he told me that he bumped into Charlie Ross carrying his laundry into a boarding house. (Even then it was not clear whose laundry was involved.) Naturally they roomed together. Fred left Imperial a few months later to go to J. R. Watkins Company in Winona, Minn., where he was to take over some laboratory job, with minor supervisory powers. If his line has developed as of old, Fred should be vice-president or chief stockholder by now. It's more than a year, though, since I heard from him. [Editor's note: He now represents the Watkins Company in Newark, N. J.] — Phil Kurz got placed in the labs of Norfolk Paint and Varnish Company a few weeks after graduation. He was there only a few months when he left and wound up in the Massachusetts Gas Company in Everett, in the labs which Gordon Gott had just left. He has been there for over a year now. Phil came to the Eastman Building frequently during the summer. . . . Howard Mason was working during the last school year for his master's in chemistry. His thesis with Professor Wildes '22 involved certain work with vitamin A — a matter to raise the hair on anyone's head, How's being no exception. During the investigation several thousand (?) dollars worth of vitamin A concentrates from cod-liver oil was handled, working always in fear and trembling and in the absence of oxygen. It is a tribute to the wizardry of this unostentatious financial genius that so far no Federal investigation has been carried on into his bank account. During the summer he continued his vitamin work for a while, but soon he secured a temporary government job as a junior chemist, working in the government appraiser's office in Boston.

Bill Lauder has been working since graduation at the Mutual Chemical Company of America in Jersey City. The company manufactures chemicals of all sorts and apparently of all degrees of viciousness. Bill has been telling me horrible stories about sodium sulfate and opened my eyes to the nastiness of character of this seemingly innocent substance. From now on I trust no chemical, however virtuous its appearance, without character references. About a week after meeting Bill Lauder I bumped into Fred Travers on Massachusetts Avenue where he was (believe it or not) waiting for a street car. Fred had started after graduation in Rochester, N. Y., for a company whose name I do not remember, but the salary was insufficient. He transferred later to the Plymouth Cordage Company in Plymouth, Mass., where he is working now. Plymouth is one of the largest cordage manufacturers in the country,

and to hear Fred talk, he has something to do with each foot of it. His job seems to be research-control work: testing of dyes and oils used in finishing rope, devising of new concoctions, analyses of materials, supervisory work. Next time you see a piece of Plymouth rope, remember that Fred had something to do with it.

Paul Panagiotakos is back. After a year and a half of rather phenomenal success at the Atlantic Refining Company, he arrived back at M.I.T. as a candidate for the Ph.D., holding a teaching fellowship. It is a pleasure, even from the back, to watch him drilling the juniors in the geometrical construction of hexagons. I was most impressed, after talking with P.C.P., with the luxuriousness of the researcher's life at Atlantic Refining. Somehow that doesn't seem right, and is probably due to local pride and the research reticence. I was told that about a dozen patents are on their way through the patent office in his name — to date probably the record for accomplishment for V-'35. — Mardy Mardorian, Course V's strangely mild wrestler, is the only one of the group whose occupation I can't say anything about with certainty. I have heard that Mardy is working for his father. — Dudley Williams continues his assistant's position at Brown University. Details have not been forthcoming, but latest news mention a trip through Fort Meyers, Va., where he met Mrs. Priscilla Bunker Maury.

Finally the colossal Stockmayer (Secretary's note: more of Stocky later): I want to mention his one-day trip to Tech during last summer, when I saw him for a few hours. We started a private bull session in the recesses of Eastman Building, but Stock's presence was signal for open house, which soon produced a sizable group. It was practically an informal lecture before he left. — As for myself (Secretary's note: In case you have forgotten by this time, the author of this lengthy epistle is Perk Ehrlich), temporarily unemployed. Now have an S.M. from Tech. During this last year two publications appeared in *Organic Syntheses* with my name tacked on as junior author, and one appeared in the *Journal of the American Chemical Society*. These are the pride and delight of my life; I feel frankly like a fond parent and wish I had cigars to distribute." A later letter from Perk mentioned that a short time after Leo Epstein returned to school, a New York firm offered him a job — the irony of it all.

We finish up this time with a long letter from Stocky. It has been quite some time since news of him appeared in these columns, so I expect you will all be as glad as I was to receive his letter. Here it is for the most part: ". . . I last wrote to you in March, 1936. Well, then came the Easter vacation. I had hoped to get abroad again, but had to stay in Oxford for most of the six weeks' vacation, working on my apparatus. However, I did get in two week-ends in the country (thanks to a benevolent — and good-looking — English girl). For the last week and a half of the vacation our college crew went

to London to train for the annual 'Eights Week' held in May. There we rowed miles upon miles every day. It certainly gave me a strange sort of thrill to row past the Houses of Parliament, the Tower of London, and Westminster Abbey, under Tower Bridge and London Bridge; it's much more fun than the usual method of sight-seeing! After this training period we returned to Oxford late in April for the last eight weeks of the college year. During this time I again led far too leisurely an existence, but I did learn how to propel the kind of flat-bottomed boat called a punt, by pushing on the river bottom with a ten-foot pole. Such a vehicle would be useless on most United States waterways, but is admirably suited to the shallow ditches that pass for rivers here. During the last part of the term, in June, the river was always crowded with romance-seeking punters. Our college crew didn't do too well in 'Eights,' losing two places, but I must have learned the sport to a fair degree because after term I was chosen for a very unofficial Oxford junior-varsity crew to row at the Royal Henley Regatta, held from July 1 to 4. This was a great experience, for we lived in a little country village near Henley and got in a lot of good walks. At the regatta, in which four United States crews were entered, our crew (which was called the Isis Boat Club) was put out in the second round, about what we expected. I almost forgot to mention the surprisingly sudden appearance of Dick Jarrell on a classy English racing bike! . . . He stayed overnight at the Oxford Youth Hostel, and the next morning we went canoeing on the river, which gave Dick the chance to exercise his movie camera on the spires of Oxford. I hope the camera has stood the strain — I want to see those shots some day. That turned out to be the only time I saw Dick, for he sailed back home early in July.

"In the meantime I'd sort of been wondering how to spend my summer. Germany and the Olympic Games beckoned strongly; so did Prague, Vienna, Budapest, Venice, and all those dives. So what did I do? Sailed for the United States of America on the S.S. *Bremen* on July 10! You guessed the reason, probably: I came home to see Marie, whom some of my more vulgar Tech classmates remember only as McTavish. So I was back in the 'Land of Milk and Honey,' as we exiled Americans call it, for six weeks. I soon got in touch with Otto Zwanzig, Paul Herkart, and Ed Helwith, the Dogfish, and we had several get-togethers. Otto and I even went to see the Yanks play a double-header. Believe me, the baseball, hot dogs, and hamburgers certainly hit the spot!

"Of course I visited Tech, where a few '35 men were still in evidence, including Perk Ehrlich, Jim Libby, Howard Mason, Bob Fassoulis, and Hank Ogorzaly. The place looked great, especially the new sailing pavilion, but I didn't get a chance to go out on the river (Secretary's note: looks to me as if Stocky went to England to learn the benefits to be derived from water vehicles — I could have told him

1935 Continued

that before he left). I swapped notes with Mr. Seldon at the Dorm office; he seemed just a bit peeved about my cracks at the English in my last letter, which (you louse) was, I understand, reprinted in *The Tech*. (Secretary's note: Just to show the freedom of the press or something, I invite Mr. Seldon to write to me in retaliation and I'll guarantee, with the permission of the editors, to print it.) I also had several meals with Professor Ashdown '24 and Bill Carlisle '28. I even got in a week's vacation up in Maine, near enough to Boothbay Harbor so that I was able to visit Hammy up there.

"But the Jesus College labs were calling me back, and before the end of August my nose was to the grindstone (?) in Oxford again, and that's where I've been ever since, with the exception of two days' visit to Swansea in South Wales, one of the big cities in the depressed coal areas. Those people are having an awful time, with very little prospect of ever getting jobs again — the market is gone. So it's little wonder that left-wing politics are strong there. I'm rowing again this year, and was lucky enough to get a long trial in the second varsity boat, but I've finally been kicked out, as I expected. That puts me back in the college crew again. My plans for the future are not definite yet, but I rather think that I won't stay here a third year. It's a pleasant enough life, but will only lose time in the end. I may be back at Tech again next year. I'm going over to Germany again this Christmas, but more reluctantly, for the warlike aims of the Hitler dictatorship have become far more apparent in the last year. This time I won't confine myself to Southern Germany, but intend to take in Hamburg, Bremen, Berlin, and Dresden as well. Next spring, if all goes well, I'll finally get to Paris! Give my best to all the gang, including several men to whom I owe letters."

After writing about so many of the fellows taking advanced studies, I decided to do likewise: February 1 will find me registering at the Harvard Graduate School of Business Administration. I'll spend one year in the Business School and then one in the Graduate School of Engineering, taking mechanical engineering whereby one can enter the Business School in February and finish a full year of regular work by the following August, thereby permitting registration in the regular terms of the Engineering School in September. If all goes well, I'll be an M.S. in engineering administration, June, 1938.

I expect to take a heavy load of courses and won't have so much time for this reporting, so I'll have to depend upon you to write in without prompting. If each of you wrote in twice a year the way Perk and Stocky did this time, my troubles would be over. How about it? — ROBERT J. GRANBERG, *General Secretary*, Care of The Technology Review, M.I.T., Cambridge A, Mass. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

Another month rolls around and with it another section of class notes. I don't know how fast the time goes for everyone else (like other writers, I hope that all our readers are just waiting to see what the next issue of *The Review* will say), but I do know that before I can get my breath from the writing of one month's news, it's time to sit down and type up something for another month. This duty is not very arduous when I have plenty of letters upon which to draw, but it is somewhat difficult to try to write a newsy column with no material. All of which leads up to the usual request for more letters, especially from those whose names have not yet appeared in this column. There is no need to be bashful about writing, and incidentally these pages form a good medium through which to let your friends know what you are doing. Believe me, your friends are interested in you!

Course I. The news from the Civils is entirely from our two research fellows, Dudley Mylchreest and Ariel Thomas. Dudley is at the Fritz Engineering Laboratory, Lehigh University, Bethlehem, Pa. The poor fellow complains that the town is quite a comedown from Boston because it has not even a PWA orchestra, let alone a symphony orchestra. Moreover, there are no parks to compare with the Boston Common, and the Lehigh River is far from handsome compared with the Charles River Basin. All of which adds up to the fact that he misses the old M.I.T. Concerning his work, Dudley says: "I am here half studying, half researching. The research is on stress distribution on Vierendeel trusses to be determined by the photoelastic method using celluloid models one-quarter inch thick. So far I have acquired no more than a smattering of the theory of photoelasticity, learned how to operate the apparatus, computed stresses in the model, and started work on the frame to hold the model for testing. I am taking courses entitled 'Theory of Elasticity,' 'Advanced Structures,' and 'Research Methods.'" Considering that this letter was written in the middle of November (it was delayed by traveling through two other hands before coming to mine), it would seem that Dudley had a pretty good start on his work.

Ariel Thomas gives his address as 507 South Sixth Street, Champaign, Ill., and his work as a research assistant in sanitary engineering to Professor Babbitt at the University of Illinois. Very technically, he says: "At present we are engaged in a series of tests on the digestibility of garbage and sewage sludge. This is a continuation of previous work. The attempts being made to dispose of garbage by digestion with sewage sludge in several of our large cities is the reason behind these tests. It has been suggested that if Imhoff tank sludge containing garbage can be concentrated to eight per cent volatile solids, the digestion will become much more rapid. This, if true, would decrease the size of tank and the period of retention. To prove or disprove

this theory is one of our aims. What part of garbage divided by sizes is the most difficult to digest aerobically and anaerobically is also being investigated by digestion tests and B. O. D. I have a staff of 10 N. Y. A. men and a full-time laborer who runs the sewage-disposal plant. The plant is a small-sized sewage-treatment plant which gets its sewage from the Champaign-Urbana trunk sewer and throws its wastes back into it. Such is my work. There is plenty of it and yet I am learning so much that it is well worth while."

Course II. Jim Patterson, 232 Highland Avenue, Buffalo, N. Y., writes a short note full of hidden meaning for Course II graduates: "I had a letter last week from Laddy Reday (December 14). He reports that Graton and Knight Company has sent him out to Cincinnati, Ohio, where he will be in charge of the branch in that city. While he was in New York at the 12th National Exposition of Power and Mechanical Engineering, he met Leo Simons. Judging from Laddy's observations, it would seem that Leo has definitely decided to step out of the bachelor ranks. Apparently the counsel so effectively administered by Messrs. Calderon and Sarvis in the dorms a year or so ago has been quite forgotten. What about the bottles of champagne that were bet on that same occasion? Laddy also wrote that Louis Testa (-the-besta. 'He makes them say uncle') has been seen around the Institute. About two weeks ago when I started out by rail for a week-end in Utica, found myself in the same car with Phil Johnston, who was graduated in Course II in 1935. He was on his way back to Rochester where he is working for Carrier Corporation. His work takes him out of that city now and then, and he seems to enjoy it."

Course III. A letter from Charlie Price, Hotel Wallace, Lebanon, Pa., came just too late for inclusion in last month's notes. He complains, also, that the days are not long enough and regrets that he cannot do justice to the job of Course Secretary. Henceforth, then, these duties will be undertaken by Stanley T. Johnson, 718 Linden Avenue, Pittsburgh, Pa. Charlie says: "We are opening up a new mine at present, and my golden opportunity here lies in the possibility of my holding down the job of mining engineer for the new enterprise. At present I am kept very busy at the old mine with all the surveying and a lot of manual labor to do. So far all the tunnels for which I have been responsible have turned out all right, but I believe my prayers to be as potent an influence as my transit work. All the common errors have already been committed, however, so things are bound to improve." Give it to them, Charlie!

Course V. Arthur Sedoff out at the University of Idaho School of Forestry, Moscow, Idaho, wrote a letter addressed to all members of the Course through Freddy Carten. Art sent a cancelled stamp with a map of the Oregon territory on its face to show the vicinity where he is located. If any readers have copies of this postage stamp, they can locate Moscow

1936 Continued

by the fact that it is but 24 miles from Lewiston, which is shown on that map. Moscow is 2,700 feet above sea level on a high plateau with some rolling hills and a few mountains in the distance. The soil is very fertile compared to the parched land that Art saw on his way from Chicago, and practically every acre is planted with wheat. The town, although it has only 3,000 permanent residents and 2,600 students, has stores at which one can buy all the standard brands of goods just as in the East. There is even a department store and a delicatessen where you can buy sandwiches and some beer — or the beer alone. Art closes his letter with a short discussion of the native vocabulary: "The word 'slick' occurs very often and seems to cover a multitude of sins. It means slippery, sleek, smooth, polished, pretty, attractive, and many other things as the occasion demands. I have heard it applied to floors, ice, girls, hair, roads, art objects, and other things. You interpret the word as the person means it from his tone and manner of using it." This still leaves the question of what a chemist is doing at the school of forestry; I don't know the answer to that one either.

Course VI. Roman I. Ulanis tells about himself as follows: "On July 7, I started work with the Federal Shipbuilding and Dry Dock Company of Kearny, N. J., in the engine department. The name of the concern indicates the nature of their business. My position there was very interesting for me, but I did not feel at home doing mechanical engineering work. In time I had an offer from the New York Edison Company and on October 20 I resigned from my previous position and began work with them. I am now employed in the engineering distribution department and I like my present work since I have always been interested in public utility power work." This letter was included in one from Nick Lefthes, 11 Ward Street, Salem, Mass., who writes: "On December 10, Phil Norton, Bill Metten, and I started work as assistant operators helping to solve problems on the differential analyzer. The work is not difficult but it is only temporary, and we do not know how long it will last. A. L. Cloutier and Edward Lew are back in school to complete their studies, but Cloutier has transferred from Course VI to Course IX. It seems as if the entire electrical course has been revamped, and Cloutier would have had to begin over again, and as this meant spending another year at school, the change to Course IX resulted. Cloutier is still in the same locker room with the rest of the boys and is taking an active part in all the card games played during the morning, lunch hour, and many times, if I remember correctly, beyond the lunch hour." I'll bet this brings back memories to some of the boys who participated in similar games.

Course VI-C. We certainly were disappointed to receive this letter from Jack Cook, 16 Belfry Terrace, Lexington, Mass.: "Here's all I could scratch up this month in spite of my grand avowals of last contact. From the scarcity of answers

to my heart-rending appeals for information, I would judge that there are a lot of VI-C boys still unemployed. Perhaps you'll find time to philosophize in the column and recommend that they get hold of a recent series of articles in the *Saturday Evening Post* written by J. P. McEvoy on the subject of a father's letters to his son or *vice versa*. Good stuff for boys with waning self-assurance. Joe Gratz, who left our Class and the hallowed and reverberant halls of Technology to finish his term at Harvard, writes that he and his mother bought a car this summer and spent a month touring New England and upper New York state. He couldn't find anything right away in communications, so he is bidding his time with a commercial securities corporation in the big city. Your tardy correspondent has grown the stubs of author's wings. The *Christian Science Monitor* accepted a short account of the eclipse expedition which was to run in a January issue of the Wednesday magazine supplement." Naturally, we were eagerly awaiting the startling *exposés* of intimate lives that Jack had promised, but of course staid news is better than none at all.

Course VII. I have received a brief note from Ed Pratt, 318 Vanderbilt Hall, Longwood Avenue, Boston, Mass., explaining that he has no news for us this month because he spent the month of November at the Haynes Memorial Hospital with scarlet fever (one of the childhood diseases). We are glad to hear of his recovery, and hope for some news from this Course in the near future.

Course IX. The first authentic news from Jack Austin has at last reached us. I quote: "My job as a runner as reported in The Review is long since over. I ran for three days, and have subsequently passed a month in the cages, in the billing department, in the trading room, and in the statistical department. After a week out for a honeymoon (at least we got this straight in our account), I went back to the trading floor where I'll be until February 1, barring further accident. It is a far cry from mechanical engineering to trading insurance stocks, but I certainly enjoy what I'm doing at present. I get the jump on all the news, too — I sit right next to the Dow-Jones daily news ticker." It is The First Boston Corporation in New York to which he refers. And right here I would like to cite this error in the news as a lesson to everyone else. If no letters come to tell us otherwise, we will naturally print the rumors which come along even though they place one running the streets of New York as they did Jack: another good reason for writing a letter telling about yourself.

Slim Beckwith, United Air Lines, Municipal Airport, Chicago, Ill., has been moved to add his bit to the story of the activities of "ye men of '36." He writes: "Commencement week is a blank last chapter to my Technology Career, as I was in San Francisco at that time being acquainted with the air-line dispatch routine for United Airlines, for which company I am now working. Dame Fortune stepped my way when, after studying

two years of meteorology (mostly at 8:00 A.M. classes) along with the engineering courses of IX-B, a position with this company presented itself last spring. My position is that of an assistant dispatcher and meteorologist. In addition to the ever-changing routine connected with the dispatching of trips, I am conducting discussion classes in meteorology for 25 or 30 pilots. (A swell bunch of fellows they are, too.) I'm learning a great deal more about the practical side of this weather question in talking over situations that come up every day. . . . Returning from California (on a company pass, of course) I worked most of the summer finishing up my thesis at Tech and then started work on August first at the Newark Airport Terminal. On November 1, I was transferred here to the Chicago Terminal. This transfer has opened up better opportunities for me as the operations headquarters are in Chicago.

"Warren Devine, XV, is working for United in the same capacity as mine and is stationed at Omaha. I haven't had a chance to see him, but expect to do so soon when I take one of my 'familiarization flights' to Omaha and Cheyenne. While in Newark, I bumped into Paul Mulkern, XV, who is working for a rival air line as passenger agent. He was stationed at Newark the last I knew, but he might be in Texas or California by now, the way people get moved around in this game. Last but not least, my roommate at Tech, Beanie Rulon, VI-C, was still working for Philco at North Philadelphia when I visited him the latter part of October. He seems to be enjoying his work which at present is more or less a training program in the various departments of the plant. I hope that anyone interested in looking me up, should they drop in at the Municipal Airport here, will do so." Let's have a few letters like this one from the rest of the Class.

Course X. Further news has come in from Gerry McMahon out in Ponca City (what a name!), Okla. He is living at 113 South Palm Street, and says: "I started work here on November 1 for the Continental Oil Company as a junior chemical engineer. I like the work at the plant very much. My work alternates between the office and the plant. For the past three weeks, I've been running a test with Lloyd W. Vickery '29, on the solvent loss in one of the processes. My hours are 8 to 5 on Monday, 8 to 4, Tuesday to Friday, and 8 to 12 on Saturday. Everyone at the plant is very nice and easy to get along with. . . . The town has a population of 20,000 and is quite up-to-date. It is an air-mail stop, has reserve officers' meetings every week, and has an Alpha Chi Sigma professional chapter. (It appears to be more of a place than its name implies.) I had chili for the first time a few days ago and is it hot! I hardly ate any at all and had to follow it up with a glass of ice water." This should serve as a warning to the rest of us to keep away from those oil fields.

Course XIV. Jack Hamilton, 5815 Buffalo Avenue, Niagara Falls, N. Y., tells us a little bit more about the doings of this

1936 Continued

Course: "When the American Steel and Wire ran into some trouble with their steel analyses, they tossed the problem into Harold Brown's lap, at the same time lightening up a bit on his very irregular schedule of working hours. Up to the time of his last letter, he had not made much progress on his research because of the great rush of steel orders. A salary increase has helped him bear the added strain. Dick Hitchcock's wedding day has been set, tentatively, for February 12. Hitch is working on the development of a new alloy and seems to be pretty busy at the moment. Robbie has had a raise, and he and I are otherwise about *status in quo*. Haven't heard anything more from Kanner — maybe those deuterons got him." Neither has Jack heard from Wade, but we met him at a dance at Tech some time ago. El is working for Scovill in Waterbury, Conn., the same firm that houses Brent Lowe. As we have heard in other cases, neither knew the other was with the firm when they met on the streets of Waterbury after having been at work for about a month. Each thought the other was just in town for the day until it finally came out that they were under the same roof.

Course XVI. It seems as though the news from this Course is coming in from all angles including Bus Schliemann with Chance Vought Aircraft Corporation, who is living at 47 Chapel Street, East Hartford, Conn., and Dorian Shainin with Hamilton Standard Propeller Company, who is living with Sam Loring at 36 Judson Avenue, East Hartford, Conn. A compilation of the news from these various sources shows the following: Dick Koegler and Bob Lutz are still working for Consolidated out in San Diego, Calif. Dick is doing wing designing. He had a special problem come up and used new structural shapes for a wing. He had

to test the shapes for allowable stresses first, as there were no data available. Dick can't make up his mind about California weather. At first he said: "In summer this place is nothing more than a desert." But it rained after that, and with the coming of the spring weather in the winter he thinks the place is just too nice. — Fred Locke, who decided to try Stevens Institute of Technology after his sophomore year at M.I.T., is still there and is still betting on a European war in a month. — Jack Chapper, Henry Runkel, and Joe King, are all with Curtiss at Buffalo. Runkel is in design and Chapper in structures. Henry works overtime so much that he says: "I can't even get to a bank to deposit my money, never mind spending it." — George Ray is with Douglas in or near Los Angeles. — Larry Sharpe is with the x-ray division of General Electric at Schenectady. — Jim Breathitt is finishing up at Tech and worrying about his thesis right now. — Also still slaving away at the Institute are Cook, who is assistant to Professor Draper '26, and Dave Gildea, Drew, and Johnny Myers, who are in the five-year course. — Charlie Endweiss is a naval cadet at the Naval Air Station, Pensacola, Fla. — Harold Miller is now drafting for Glenn L. Martin in Baltimore. — Marc Warmuth has recently secured a job with Fleet Wings. — Ed Dashefsky is down in Farmingdale, Long Island, working for Seversky Aircraft. — Webster Francis, who is now married, came home with his wife one day, after visiting some friends, to find their house burned to the ground and just a bit of smoke left. This certainly is tough luck.

Course XVII. We have some more details about some of the building people. Art Carota reports that he is still working for the same company, but is getting to be faster in his clerical work and does

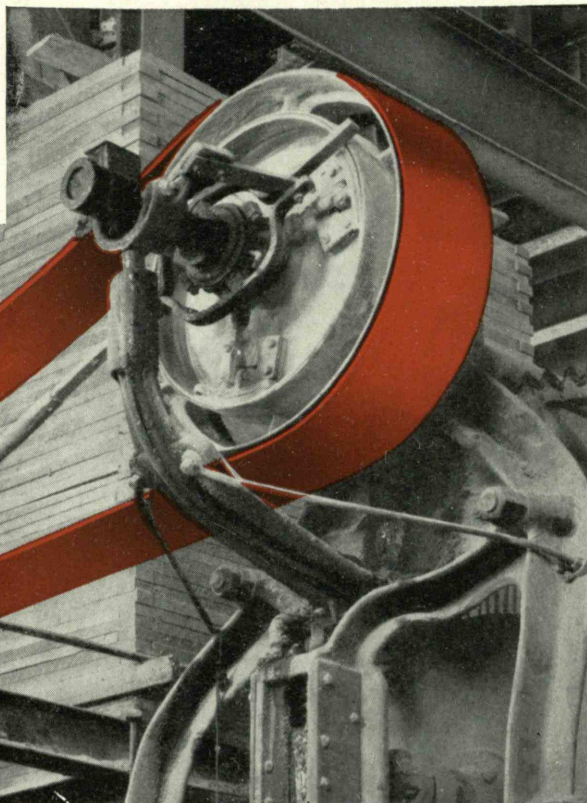
some of it at home so that he manages to get out on the job for five or six hours a day except on Wednesdays and Fridays. Then he has to make up the pay roll and do other work pertaining to costs. When on the job he runs lines and levels for the superintendent and has other minor jobs turned over to him to see that they are properly done. Two changes in superintendents are probably due to the company's losing money on the job. All have been swell to Carrots, and have helped him a lot.

Halloran writes: "I have a new job and an Irish promotion working for the same boss. I am working on his development in Winchester, Mass., with the official title of super, but clerk or chief of stooges would be nearer the mark. I like it a lot better doing some work out of doors, and it certainly is a good opportunity to see some more workings of the real estate machine." — Rather belatedly, it is my duty to report that there is no immediate prospect of Charlie Betts's trying to make one dollar do the work of two. Even this note will probably get Charlie down on me; he says they haven't yet finished kidding him about the original note concerning bachelor tendencies which appeared in this column.

Course XVIII. A brief letter from Eli Grossman, 26 California Road, Mount Vernon, N. Y., says that Harold George is a mathematics teacher in his home town, Plains, Pa., and that Albert Schaeffer sends word that he is an instructor in the mathematics department of Purdue University.

So we come to the end of our news items for another month. We would like to hear from the rest of the Class in the near future as indicated in the opening text. See you on Alumni Day, June 7. — ANTON E. HITTL, *General Secretary*, Graduate House, M.I.T., Cambridge, Mass.

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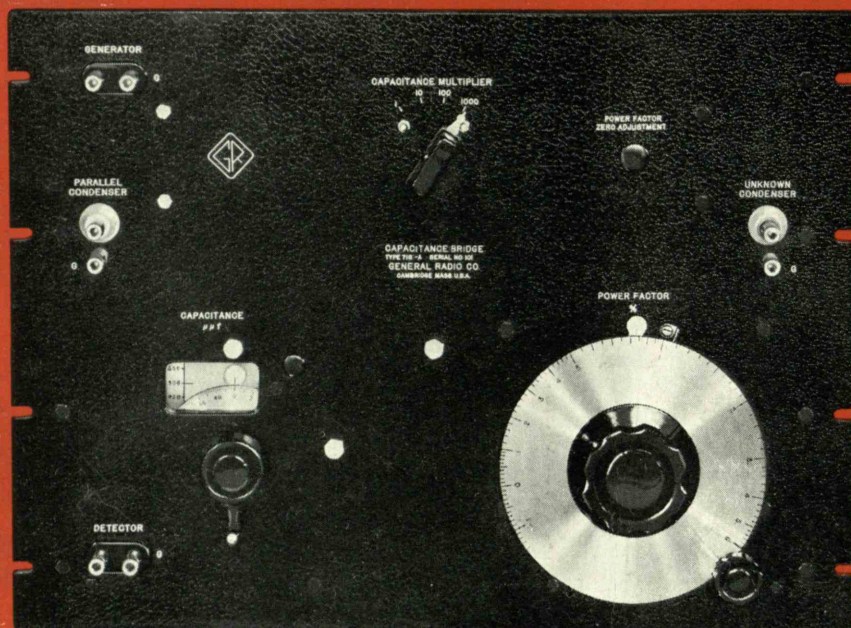
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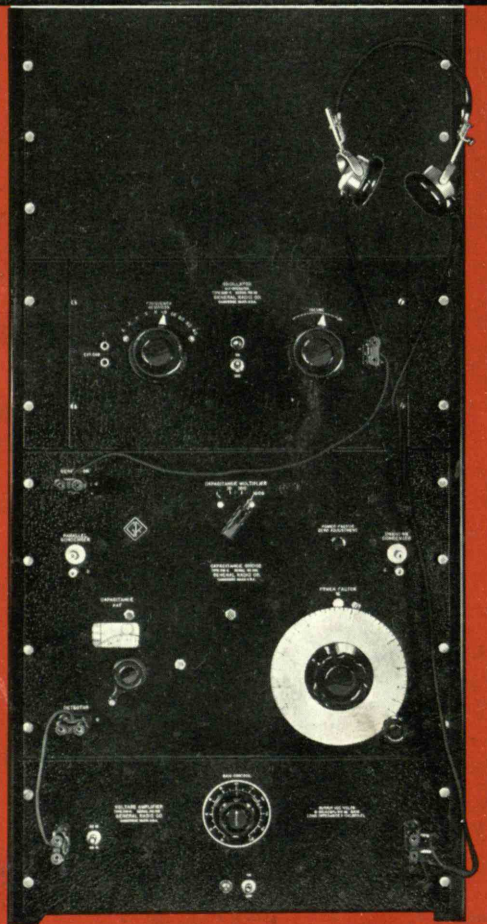


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